COAL AGE

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Coke Plants and the War

THE war in Europe has suddenly brought home to the managers of American byproduct ovens the realization that vast quantities of benzol have been wasted and are still going to waste in the coke-oven gases.

With the price of benzol now ruling, it is quite doubtful whether the coke or the benzol should be classed as the byproduct. There is no question as to which is in greater demand; in fact, at some byproduct plants where there is practically no demand for coke the ovens are being run for the byproducts and the coke is being put in stock piles.

With practically no demand for coke and hundreds of ovens idle the byproduct plants are taxed to capacity and are working overtime to fill orders.

For several years German engineers have been trying to enthuse American coke-oven men with the possibilities of benzol recovery plants, but mostly with poor success; for this the Germans are now undoubtedly thankful, as the benzol recovered from American plants that have been built is being used mostly for manufacturing explosives destined for the Allies. Such is the uncertainty of fate.

If efficient benzol plants could be built overnight, every byproduct coke plant in the United States would have a benzol plant in operation tomorrow. However, since months instead of weeks are required, inefficient makeshift plants are springing up that will pay handsome dividends in spite of their shortcomings. Because of their inefficiency, there is little danger of the market being flooded by the output of benzol.

In their failure to discover these mushroom benzol plants, the Sunday - supplement editors have overlooked the sensation of the year, because the man who is most prominent in their development is none other than Thomas A. Edison, our most famous inventor. Think of the possibilities.

Nor is benzol the only coke-oven byproduct that is in demand just now. Even plain, sticky black tar that used to be a drug on the market and was gladly furnished to mine superintendents who would consent to use it on haulage ropes has suddenly assumed a value that has justified an attempt at cornering the market.

The effect of this unusual activity in byproducts will be noticeable when the coke-oven statistics for the year 1915 are compiled, in that it will greatly increase the proportion of byproduct coke produced for the year. The demand for coke is below normal and hundreds of beehive ovens are idle, but practically every byproduct plant is being run to capacity.

Ideas and Suggestions

Need for an Arbitration Law

By Charlton Dixon*

Now that the long strike has been ended in the "No. 8" field of Ohio a partial counting of the cost is in order. According to Coal Age the miners' union disbursed about one and a half million dollars. This large sum, however, probably amounts to only one-seventh of the aggregate which the miners, under normal conditions, would have earned during the same time at 44.6c. per ton of run-of-mine coal. The loss to the operators owing to the depreciation of their mines, to the dislocation of business and to the expense of maintenance is also serious. The coal irrecoverably lost to the state owing to the caving of rooms, the flooding of workings, etc., is immense.

Like most strikes, that in eastern Ohio had its inception in selfishness, was carried on in stubbornness without reason and terminated without honor or profit to either side.

Why Did So Simple a Solution Take So Much Time and Money?

Was there no means of discovering over 12 months ago that there was no other settlement possible than the one finally adopted? Had there been an interested third party with authority to speak and act before a cessation of operations took place—or in other words, had there been a compulsory arbitration board as in Canada—there would in my opinion have been no strike.

There was not a day in the 13½ months of strife when the operators would not have welcomed the assistance of such a board. They were always ready and willing to state the facts of their side as they did unreservedly before the investigating committee which Washington sent after a long wait.

The "No. 8" mine owners were given to understand that the settlement at the end of the biennial period would be based on the Pittsburgh district price—44.6c. for run-of-mine coal, the price paid then and now. The slack average proved that this price was fair and in all honor was the one to be adopted. Instead of the union favoring it, a demand was made for a higher figure, for which that organization was, however, unable to prove any just claim.

In the Hocking Valley the paying of 47c. for run-of-mine coal was justified because the slack average in that region made it a fair price. That figure looked good to the union and the miners of the "No. 8" field. Consequently they gave the operators in the Hocking Valley their word that if the operators in other parts of Ohio would immediately resume operation they would not permit the eastern Ohio field to operate unless it would pay 47c. for run-of-mine coal. This agreement was made to effect a break in the operators' ranks. The promise was made despite the fact it was a violation of a former undertaking.

Any such agreement was without justification and extremely dishonorable, but it was also imprudent as it cut all the ground from under the feet of the union, preventing any compromise on price. Thus came the deadlock, which again proved that honesty is the best of policies. It will take many years to c mpensate the monetary loss of the miners, and what of their moral obliquity? My advice to Ohio coal operators is, in future, stop, stay and start together.

The Canadian Industrial Disputes Investigation Act Shows the Way

To prevent another disastrous affair of this kind, let us hope that some legislator desirous of conserving the assets of the state from waste and its citizens from periodical spells of idleness will in the near future formulate and introduce a bill for a compulsory arbitration board. Such a body is best calculated to deal with just such cases. Every fair-minded miner and operator would give his moral support to such a bill. Whenever a party is unwilling to submit its case to investigation there is something wrong in its position.

The Canadian Industrial Disputes Investigation Act of 1907 governs all matters relating to wage allowances or other remuneration of employees, terms and conditions, etc. The Minister of Labor has general administration of the act. The board consists of three members, one being recommended by the employees and one by the employers, and these two choosing the third. Whenever any dispute exists between any employer and his employees, and the parties thereto are unable to adjust it, either of them may make application to the minister for the appointment of a board. The board must be established within 15 days.

When the creation of the board is requested, a statement is furnished telling who are the parties in the dispute, estimating approximately the number of persons affected or likely to be involved in the controversy and reciting the efforts to adjust the matter which have been made by the parties themselves up to that time. The board has the authority to make all suggestions and to do whatever it deems right to induce the parties to come to an amicable settlement.

The following clause is the important part of the act: "It shall be unlawful for any employer to declare or cause a lockout or any employee to go on strike on account of any dispute prior to or during a reference of such dispute to a board of conciliation and investigation."

A Crime to Fight First and Talk Afterwards

The penalty for a breach of this provision by the operator is not less than $100 and not more than $1000. If the employee violates it, the penalty is not less than $10 nor more than $50 for each day or part of a day that such a lockout or strike exists. The act further states that it shall be an offense for any party to incite, encourage or aid any employer in any manner to declare or continue a lockout or to induce any employee to go or to remain

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on strike contrary to the provisions of the act. Such an offender shall be liable to a fine of not less than $50 nor more than $1000.

Saved Millions of Dollars

This law has prevented the loss of millions of dollars to employers and employees, not only to those engaged in coal mining, but to men in all other industries in the Dominion. Of course, even after all in reason has been done to avoid a stoppage of work, it is possible for one to take place, as happened in Vancouver under the guise of a "vacation," but neither the government nor the public was deceived by such shallow tactics and the strike ended ignominiously for the party unwilling to arbitrate.

Had the "No. 8" field been compelled to present its troubles before such a board, public opinion would have been all on the side of the operators. Why the United States Government has not long ago seen the wisdom of such an act as that established in Canada long ago is a mystery. Such a law could do no harm, and its power to effect good is incalculable. This is an important subject and a good time for Coal Age readers to debate it.

Protecting the Workmen

By H. M. Wassum*

During the past few years more and more care has been taken by nearly all the bituminous coal companies to prevent accidents in the mines and to reduce their number. No one questions the fact that all operators should make the conditions as safe as possible for the men; and I have generally found that they are anxious and willing to do this. Of course, as in everything else, there are exceptions to this rule, but it is only by the smaller companies, and such cases are soon brought to the attention of the state inspectors.

The mining laws of most states are rigid in regard to this matter, but we find that the operators, especially the larger ones, are not only obeying the laws, but are going farther and taking extra precautions whenever they think them necessary.

While we do not like to place a value in dollars and cents on human lives, we have often wondered if the coal companies are receiving full value for the large sums of money spent for this purpose. Are they spending the money in the best way possible to save the lives of the workmen? In the care and oversight of the men, I think not.

While the number of fatal accidents per million of tons of coal mined has been reduced, this reduction is not in proportion to the larger sums now being expended to this end, and we have reached or soon will reach the limit of expenditure possible for this work. Now the question is, How will we obtain better results? If we saved 100 lives last year, could we not have saved 200 with the same effort?

Most Accidents Due to Carelessness

What is the cause of the greatest number of accidents in the mines today? From the 1913 report for the bituminous region of Pennsylvania we copy the following statement: "Of the 561 lives lost inside the mines, 325, or 57.93 per cent., are attributable to neglect or carelessness on the part of the victims themselves; 11, or 1.96 per cent., to the carelessness of others; 127, or 22.64 per cent., to accidents beyond the control of the victims themselves, and in 93, or 17.47 per cent., the responsibility was not defined."

Accidents Due to Carelessness

Just think! Almost 58 per cent. of the total mine fatalities are due to the carelessness of the victims themselves. True, conditions have changed during the past ten years, but we are hardly taking this change into consideration in our methods of dealing with the question.

Ten or fifteen years ago the miners were as a rule of the English-speaking race. These men considered their work almost a profession and took pride in it. Today, with the majority of miners resident in this country less than five years, we have an entirely different class of people to deal with, and different methods are required. With the old-time miner, if the operator met him half-way in the prevention of dangers, he would do the rest, and there would be no case for the undertaker. The trouble was that the operator did not share his half of the responsibility at that time. But today the coal companies must shoulder almost the entire burden of protection or be responsible for the result.

More men have been continually placed to oversee and direct the work. This to a certain extent is necessary, for the labor is mostly unskilled. But if a man works at the same job for two or more years, and then requires the same amount of attention as when he started, there is something wrong. It is not through ignorance that the men do not protect themselves as they should nor obey the orders given them. It is as a rule their carelessness. The men are working for what they can get out of it with the least amount of labor, and they are born gamblers when it comes to taking chances with their lives.

Men Must Be Trained to Become Miners, Not Laborers

In many mines today there are so many bosses making inspections that the miner—unless something unusual happens—can not get into danger from the time of one inspection to that of another. But the unexpected frequently happens in coal mines, and if we wish to handle this matter efficiently the men must be trained to become *miners* and not *laborers*. They must be shown that they have a responsibility and that they must assume it.

Several large companies have seen the advantages of teaching and instructing the men rather than directing and overseeing them. The men are shown moving pictures in which the right and wrong ways of doing their work are flashed on the screens. Meetings are held in which the men are invited to take part in the discussions of various subjects.

The men have been made to feel that there is something in their work besides hard labor. They are made to see that they are not simply cogs in a wheel, but human beings with some responsibility placed upon them, and they can not help but become better workmen.

I believe that money spent in this way will bring us more returns in the saving of lives than in the way we have been using it. You do not need to watch a good man; he will watch himself.

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Modern Appliances in Coke Manufacture

By E. C. Ricks*

SYNOPSIS—The beehive oven is defended on the ground that it is not now so wasteful as in former years, while the modern machines used in the process of making beehive coke have greatly reduced the cost of manufacture. Coke-oven doors are discussed at some length.

During the past few years, so much has appeared in print regarding the superiority of the byproduct and rectangular types of coke ovens that I fear many of us look upon the beehive oven as being very primitive and wasteful. Be that as it may, the fact remains that many thousands of beehive ovens are still in use, and in view of the progress made during the past year or so toward cheapening the cost of producing coke, the idea of consigning the beehive to the ash dump has been pigeonholed by the majority of coke operators.

It is not my intention to take up the merits and demerits of the different types of coke ovens in this article, owing to the limited space allotted, but simply to mention briefly the different machines and appliances used at a modern beehive-oven plant which have enabled the operators of such plants to reduce the labor cost of producing coke to a figure as low as 9c. per ton and even less. This figure represents the total labor cost from the time the coal is deposited in the ovens until the coke is loaded ready for shipment and the coke ashes hauled to the dump. No labor costs are included previous to leveling the coal, since the charging of the ovens, as well as all other costs up to this point, are practically the same regardless of the type of oven. Neither are any labor costs of upkeep included, as such costs must necessarily depend upon the condition and age of the plant, equipment, etc. I appreciate that the upkeep is a very important item, but owing to the fact that such costs at a new plant, equipped with new machinery and appliances, would be less than at an older installation, no reference to such costs will be made in this article, for fear of being misleading.

Starting with the leveling of the coal in the oven, the strictly modern plant utilizes the Covington leveling machine (Fig. 1), the only mechanical leveler for beehive ovens known. This machine, weighing approximately the same as a larry loaded with coal and geared to travel three miles per hour faster than the average larry, can level 25 ovens per hour easily, including shifting, and performs its work as well as can be done by the hand-method and much better than the average hand-leveler.

On a 200-oven per day basis, the net labor saving effected by this machine is around $10 per day, to say nothing of the additional advantage of being able to completely close and seal the oven door immediately after the coke is drawn, which is made possible by using this machine. The advantage of promptly closing the oven door, regardless of when the oven is to be recharged, is apparent in the length of time required for the new charge of coal to ignite.

This conservation of the heat is particularly appreciated when the coal bins are empty and the hoisting of coal delayed by reason of an accident in the mines or from any other cause. This leveling machine passed through the experimental stage years ago and has given satisfaction for some time, one machine having been in constant operation since June, 1909, and several others since 1912 and 1913.

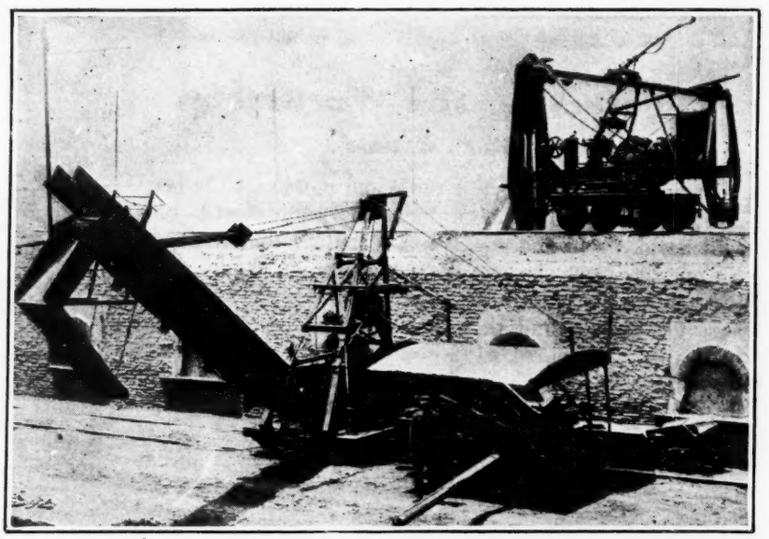

Fig. 1. Leveling Machine in Upper Right-Hand Corner and Coke Drawing and Loading Machine Below

The greatest labor-saver is the coke-drawing machine (Fig. 2), the capacity of which is from four to six ovens per hour, drawn, screened and loaded ready for shipment. So much has appeared in print regarding this machine that a detailed description of the machine and its operation is deemed superfluous. However, so many improvements have been added from time to time, including better designed parts made of better material, etc., that the efficiency of the machine has been greatly increased. The best evidence of the success of the coke machine is the number of repeat orders given the manufacturers by firms that have been using them since 1906. In addition to about six Hebb machines and about the same number of the Stauft design, there are approximately 200 of the Covington coke-drawing machines now in the various coking districts of the United States and Canada, one large coke company in the Connellsville region of Pennsylvania having 82 Covingtons.

As those who use them know, the advantages of the coke-drawing machine are many, as it not only eliminates the labor troubles experienced from time to time by prac-

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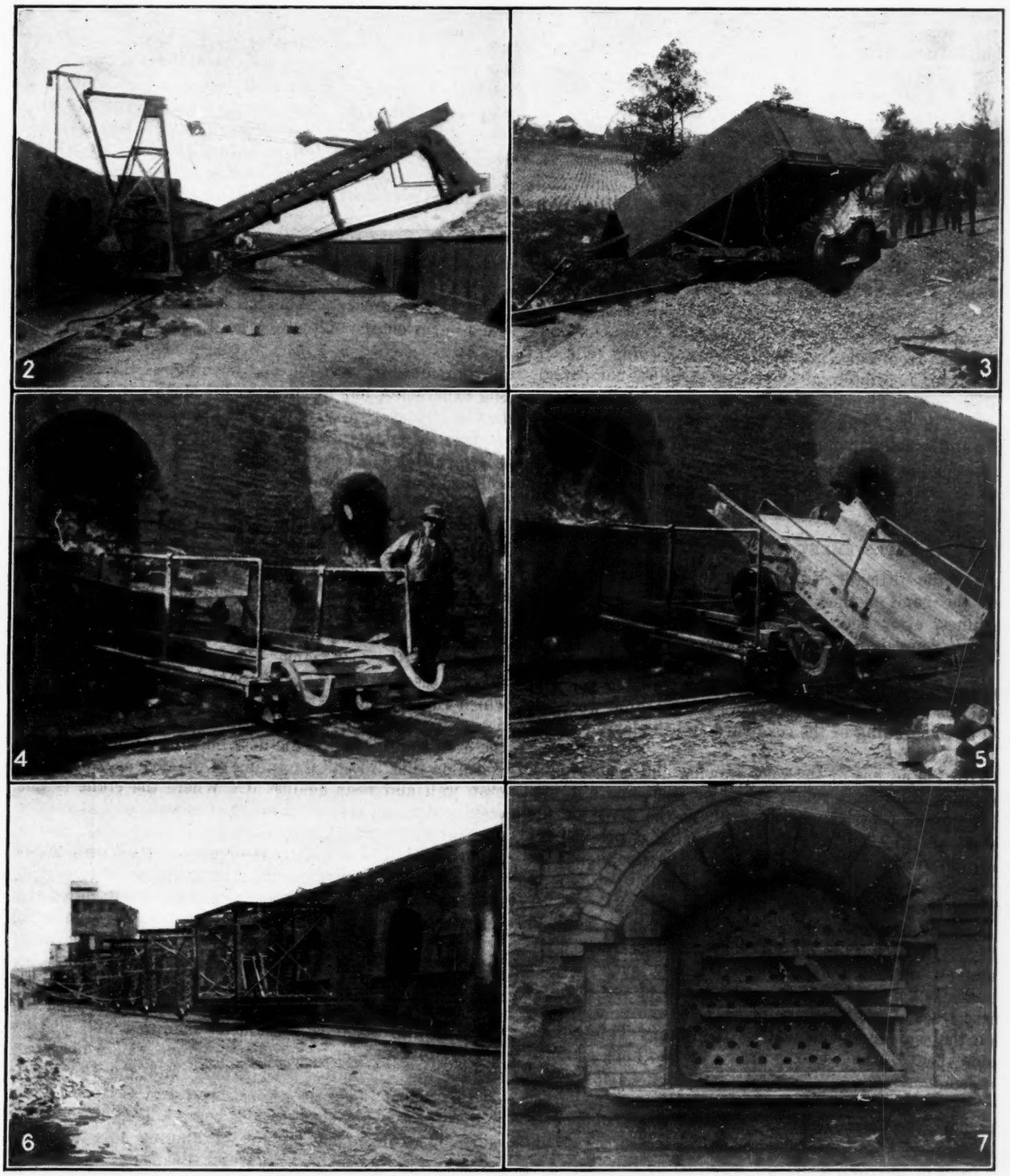


MECHANICAL ACCESSORIES FOR BEEHIVE OVENS

Fig. 2—The first electric-driven coke machine built by the Covington Machine Co. and installed at Continental No. 1 plant of the H. C. Frick Coke Co. early in 1906. Fig. 3—An ash car which is used in place of carts for hauling ashes from the coke yard to the dump. It runs on the coke-machine track and holds 6 cu.yd., being drawn by two horses. Fig. 4—Baldwin door-brick conveying truck in use at Continental No. 1 works of the H. C. Frick Coke Co. This saves many brick from breaking by reducing the height of their fall. It will pay for itself in a few months. Fig. 5—Baldwin door-brick conveying truck with the platform in the dumping position. It has just discharged the door brick on the wharf. Fig. 6—In the center is a crane for handling unhinged oven doors, such as those of the Humphrey, McMurray, Auld and McCreary types. The crane is operated entirely by hand. This photograph was taken at the Seabright plant of the Taylor Coal & Coke Co., near Uniontown, Penn. Fig. 7—Lucia door installed at the Phillips works of the H. C. Frick Coke Co. in June, 1911. There have been no repairs whatever at this installation in four years, with the exception of two replacements of tile lining. The saving effected by using this door has averaged about 9c. per oven charge.

tically all operators of hand-drawn plants, but one machine will draw, screen and load as many ovens in a working day as any 20 men in the country can draw in the same time, and the machine will do the job for half the cost of hand-drawing. The machine will also draw easily any size charge it is possible to burn, and it might be well to add that owing to the fact that the machine draws an oven so quickly, allowing the hot oven to be recharged

within 30 min. after the drawing begins, a much larger charge can be coked. In the Connellsville region, an average yield of more than five tons of coke from a 12-ft. 3-in. machine-drawn oven is common, while a 13-ft. oven yields as high as 6 tons per charge. A yield of 5 tons from any size hand-drawn oven is extremely good, 4½ to 4¾ tons being an excellent average.

In the Connellsville region, the labor cost in connection with machine leveling and machine drawing will seldom exceed 33½c. per oven, including the entire operation of leveling, watering, bricking and daubing the door and shifting cars. Adding to this the wages of a professional burner who looks after the burning of all ovens, wages of the yard boss, cost of carting ashes to the dump, forking breeze coke from ashes into railroad car, keeping railroad track clean, etc., the total labor cost still does not exceed 42c. per oven. The cost of doing this same work entirely by hand, in the Connellsville region, is seldom less than $1.25 and usually amounts to about $1.35 per oven. Figured on a tonnage basis, the saving effected by machine work is even greater, owing to the greater tonnage as previously noted.

The Improvements Pay for Themselves

As to the ultimate cost of machine work, as compared with the hand method, the net saving effected by the machines, after deducting all proper charges such as interest, depreciation, repairs, power, oil, waste, etc., has in several instances at least paid for the entire installation in from 12 to 14 months, including the labor and material cost of changing oven doors for machine work, as well as the grading of the coke yard and the laying of the machine track.

With the advent of the coke-drawing and coal-leveling machines, the Stauft rotary sprinkler also came into use. This unique contrivance, operated by the force of the water used in quenching the coke, makes it possible for one man to water three to four ovens at a time, doing the work better and cheaper than it can possibly be done in the old way and with less water.

Another improvement is the side-dumping ash car (Fig. 3) which runs on the coke-machine track. The ashes are deposited by the coke-machine conveyor at a point about 3 ft. beyond the outside rail of the coke-machine track, from which point they are shoveled directly into the ash car and hauled to the dump. This ash car holds about 6 cu.yd. and is drawn by two horses hitched tandem.

The Baldwin door-brick conveyor (Figs. 4 and 5) is another great improvement. By using this arrangement, the door brick and mud, instead of falling to the ground in front of the oven door, are deposited on this conveying truck and dumped clear of the coke-machine track. This appliance not only saves the labor cost of forking the brick away from in front of the oven door, but many brick are saved from breakage, owing to the comparatively short distance that the brick fall. The truck weighs about 1300 lb. complete and is easily moved from oven to oven by one-man power. By means of a lever the dumping of the brick from the truck is easily controlled, and this same lever is used to right the empty truck after dumping.

A Satisfactory Coke-Oven Door

Another improvement which is just emerging from the experimental stage, but which bids fair to fill a long-felt want, is a satisfactory coke-oven door. Numerous doors have been tried out in years gone by and found wanting, but the experience derived from these earlier attempts has been valuable, and from now on we may expect to see a vast number of coke-oven doors installed, not only at machine-drawn plants, but at hand plants as well. The brick firms who have reaped such a harvest in the past from the sale of door "cubes" will be called upon to furnish tile lining for doors, unless the asbestos-bound plastic clay lining invented by an enterprising Pennsylvania chemist by the name of Campbell is found preferable to the tile.

The science of coke making has reached the point where a well-burnt charge of the highest quality coke is not all that is expected. The modern coke maker insists upon uniform charging, leveling and burning, as the result of long experience, but in addition his slogan is, "Increase the yield," and in order to do this all unnecessary air must be excluded from the oven. Surplus air means surplus ashes, which spells loss; therefore this surplus air must be excluded, and the coke-oven door is expected to deliver the goods.

Among the doors recently tried out are the Humphrey, McMurray, Auld and McCreary types, all four of these being unhinged doors which, when in place, rest on the sill plate of the door opening and are prevented from falling out partly by the inclination of the top of the door toward the oven and in some cases by a pin inserted in each side of the door frame. To remove this type of door in some cases a crane (Fig. 6, center) mounted on a truck which runs on the coke-machine track is used, the crane depositing the door on a "roost" which is embedded in the oven wall alongside the door opening (Fig. 6, right). When on this "roost," the lining of the door is toward the oven wall and rests against it. Where the crane is not employed, a rail is secured to the oven wall, well above the door arch, on which rail a trolley is suspended, to the lower end of which a short lever provided with a hook is attached. To remove the door with this arrangement, a workman inserts the hook in the proper receptacle on the door, and by pulling down on the lever the door is released and the trolley conveys it clear of the door opening, after which the door either remains suspended or else is deposited on the "roost."

The only hinged door that so far has lived through the experimental stage is the Lucia, manufactured by the Covington Machine Co., of Covington, Va., which firm makes the Covington coke drawer and the Covington leveler. The Lucia door consists of two sections and is hinged in a frame, both sections being hinged on the same side. The ingenious method of hinging this door, together with the manner in which the frame is securely anchored in the oven wall, has overcome the objections to hinged doors of past experience. One of these doors (Fig. 7) was installed in June, 1911, and today appears to be as rigidly mounted and as easy to open and close as the day it was installed.

To operate this Lucia door, all that is necessary is to engage the ring attached to each section and swing it open or shut in the same manner that any other hinged door is operated. This door is made in two sections so that the top section may be left open until the coal is leveled by hand. Where the leveling machine is used exclusively, the door need only be in one section, as the coal is then leveled, not from the door, but from the trunnel head.

Of the doors mentioned the Lucia is designed for either tile or plastic lining, the Auld and McMurray for plastic lining only and the Humphrey and McCreary for tile only. The plastic-lined doors are all made with solid fronts with projecting attachments on the inside for holding the lining in place. Some of the tile-lined doors are solid also, while others are made skeleton in order to reduce the weight.

At this time it would be hard to predict which of these several types of doors will prove the greater commercial success, although the Lucia door seems to conform nearer to safety-first principles and its operation appears more simple. However, suffice it to say that the coke-oven door has come to stay, many of them having already been installed and giving good results, and I predict that before the close of the next two or three years practically every beehive oven in the United States will have been equipped with a door of some description, regardless of whether or not the ovens are drawn by machinery.

Extracts from a Superintendent's Diary

It might be possible for a mine superintendent to direct an entire mine operation without ever leaving his office during business hours, and occasionally I have found myself attempting that very trick; but there is one thing that it is not possible to do under such a scheme of management and that is to give the feelings of the employees intelligent consideration. For several weeks now, because of a sprained back, I have been unable to travel except by means of a rolling chair, so I have been compelled to run things from the office, and I know exactly what absolute office management would mean, in my case at least.

Today when I discarded the bandages and the rolling chair and ventured forth to hobnob a little with the men, it all came to me suddenly—the realization of how completely I had lost sight of the human factor during the "brown studies" I had indulged in while confined to the office.

It so happened that on the day after I met with my accident the cost sheets of the previous month's operation were received from our auditor's office, and I immediately got busy and examined them carefully—more carefully, in fact, than I had ever done before. Nor did I stop with one examination, but got them out again and again day after day and dug into the whys and the wherefores of every item over and over again. Naturally I began to form certain conclusions and unconsciously decided upon many radical changes that I hoped would correct all of the apparent inconsistencies.

Shut up in the office with only the cold figures before me, it looked so easy and reasonable, this rearranging and consolidating of tasks to make possible the readjustment. But today with the men themselves standing before me it was an entirely different proposition.

Some of the jobs that I proposed to abolish were filled by married men having large families to support, and a few of these families had been born and reared in our camp and the fathers had been considered faithful employees always. Other changes were to affect sons who were supporting widowed mothers, whose husbands had been killed while in the discharge of their duties and in the employ of our company. And there were several newly-weds who were to suffer by the rearrangement, that had been led to believe that they might expect better positions because of their new obligations. I have never argued that it is possible for two to live comfortably on the earnings previously required by one; on the contrary, I have felt that men who annexed sweethearts should be raised to better positions at the first opportunity.

This made it clear that I should have to begin all over again, keeping in mind this time my responsibilities to the men as well as the better dividends I would like to earn for my company.

It is so easy for outsiders to suggest that corporations are not charitable organizations, nor can they be expected to give thought to the domestic affairs of their employees, and it is also easy to remark that corporations are without souls. But taking my own experience of today as typical, I'll have to take issue with the next one of my friends who makes such a statement and assure him that so long as corporations are run by average everyday citizens like myself the same average citizens can hardly be expected to act always as if they were without souls.

Texas Has Good Coal Output

The amount of coal produced in Texas in 1914 was 2,323,773 short tons, valued at the mines at $3,922,459.

The coal production of the state is nearly evenly divided between lignite and bituminous coal, the balance being slightly in favor of the bituminous. With the exception of the production in 1913, the production in 1914 was the largest on record, according to figures compiled by C. E. Lesher, of the U. S. Geological Survey.

The total production in 1914 was less than in 1913 by 105,371 tons, or 4.34 per cent., in quantity and $366,461, or 8.54 per cent., in value. Most of the decrease in tonnage was in the lignite output, which in 1914 was 1,105,613 tons and in 1913 was 1,181,156 tons, a difference of 75,543 tons, whereas the output of bituminous coal—1,218,160 tons in 1914 and 1,247,988 tons in 1913—decreased but 29,828 tons. In value, however, the bituminous coal decreased much more than the lignite.

The coal mines of Texas were not entirely free from labor troubles in 1914, as 220 men were on strike during the year with an average of three days each of lost time.

Most of the lignite produced in Texas is mined by hand, and of the bituminous coal produced nearly one-half is shot off the solid. The use of mining machines has not made much progress in the state, and those that are employed are in the bituminous mines. The quantity of coal shot off the solid in 1914 was 612,158 tons, or 26 per cent. of the total.

Washing plants have been installed at the mines at Eagle Pass in order to improve the quality of coal sent to market. In 1914 the quantity of coal washed was 23,604 tons, which yielded 19,440 tons of cleaned coal.

Use of Private Spur Tracks—When a railway company has constructed a spur track to serve a private coalyard, a lessee of the yard is entitled to shipping service on that track. The company's refusal to deliver shipments from persons or locations not served by its line constitutes actionable unjust discrimination. (Texas Court of Civil Appeals, Seeger vs. M., K. & T. Ry. Co., 175 Southwestern Reporter 713.)

Modern Coke-Handling Methods

By F. V. Hetzel*

SYNOPSIS—The manufacture of coke will doubtless increase in this country somewhat as it has in Germany. On account of its bulky character and the fact that breeze has a decided tendency to adhere to larger pieces, proper methods of cleaning and handling domestic coke deserve careful attention if a suitable market is to be secured and maintained.

Various technical journals and daily newspapers have referred to the present extraordinary production of by-product coke in Germany as a result of the great activity there in the manufacture of benzol and ammonium sulphate. In fact the situation is that ovens are operated chiefly for the recovery of these chemical products and the coke is produced in quantities so much greater than the normal consumption that railroads and other consumers of fuel have been directed by the government authorities to use a certain proportion of coke with their coal.

*Chief Engineer, Link-Belt Co., Philadelphia, Penn.

While we have not come to such a pass in this country, it is certain that the use of coke for metallurgic and domestic purposes will increase greatly within a short time and producers of it will give more attention to the preparation of their product, to the demands of the market and also to means for pushing the sale of coke where coal is now used.

In dealing with the domestic trade it is important to clean coke from the adhering breeze. Several coke producers in western Pennsylvania have built crushing and screening plants, some with overhead bins, to do this work. These were described in Coal Age of June 7, 1913, p. 876, and may be taken as representing the most advanced practice. There are, however, many places where it is not convenient to store coke in bins, especially in connection with gas works, where the daily sales of coke do not always keep pace with the production. Here the production is fixed by the output of gas that is required of the works.

In such cases large amounts of coke are often stored in the open, and means must be provided to get it from

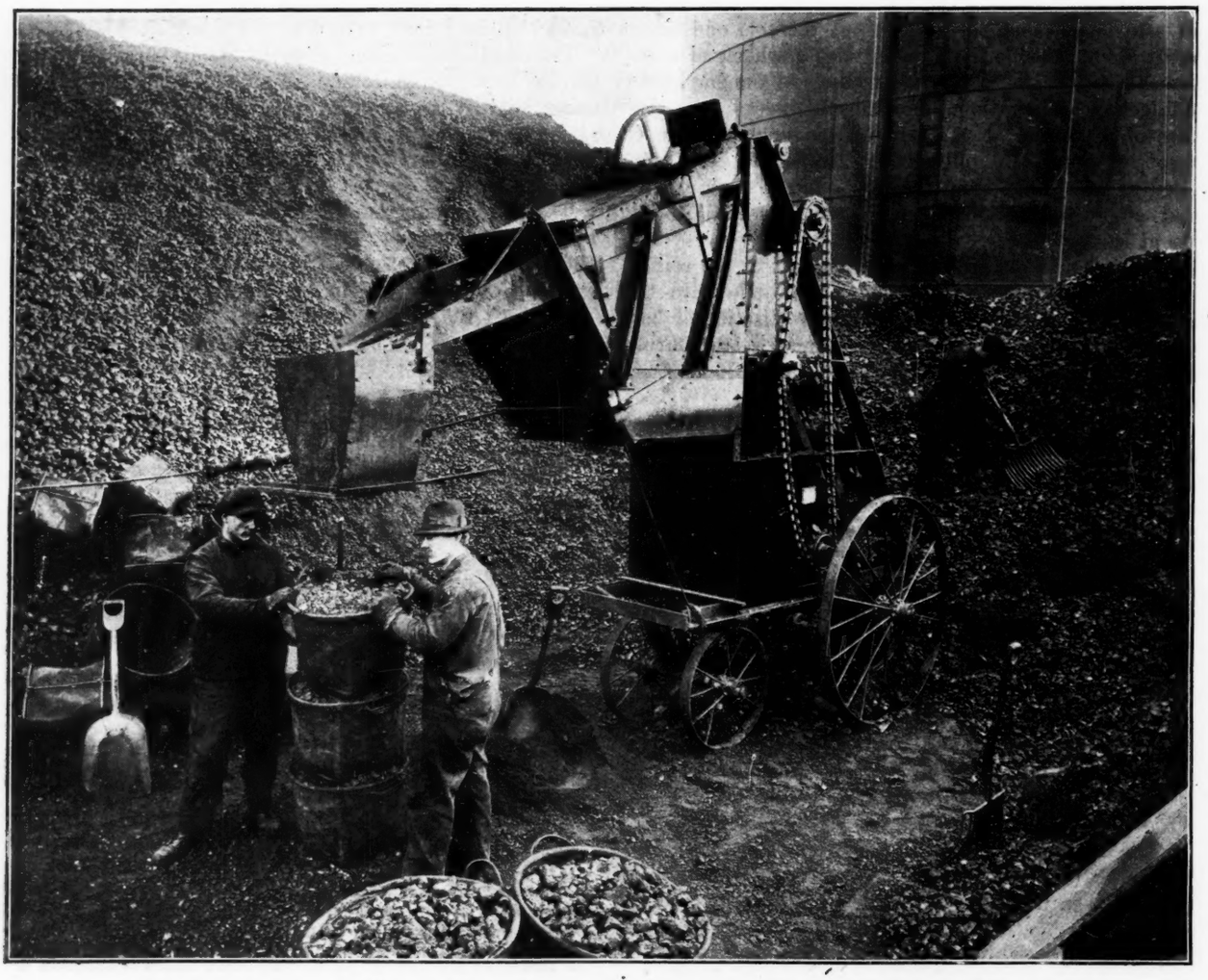


Fig. 1. A Loader Which Will Handle and Screen a Ton of Coke Per Minute

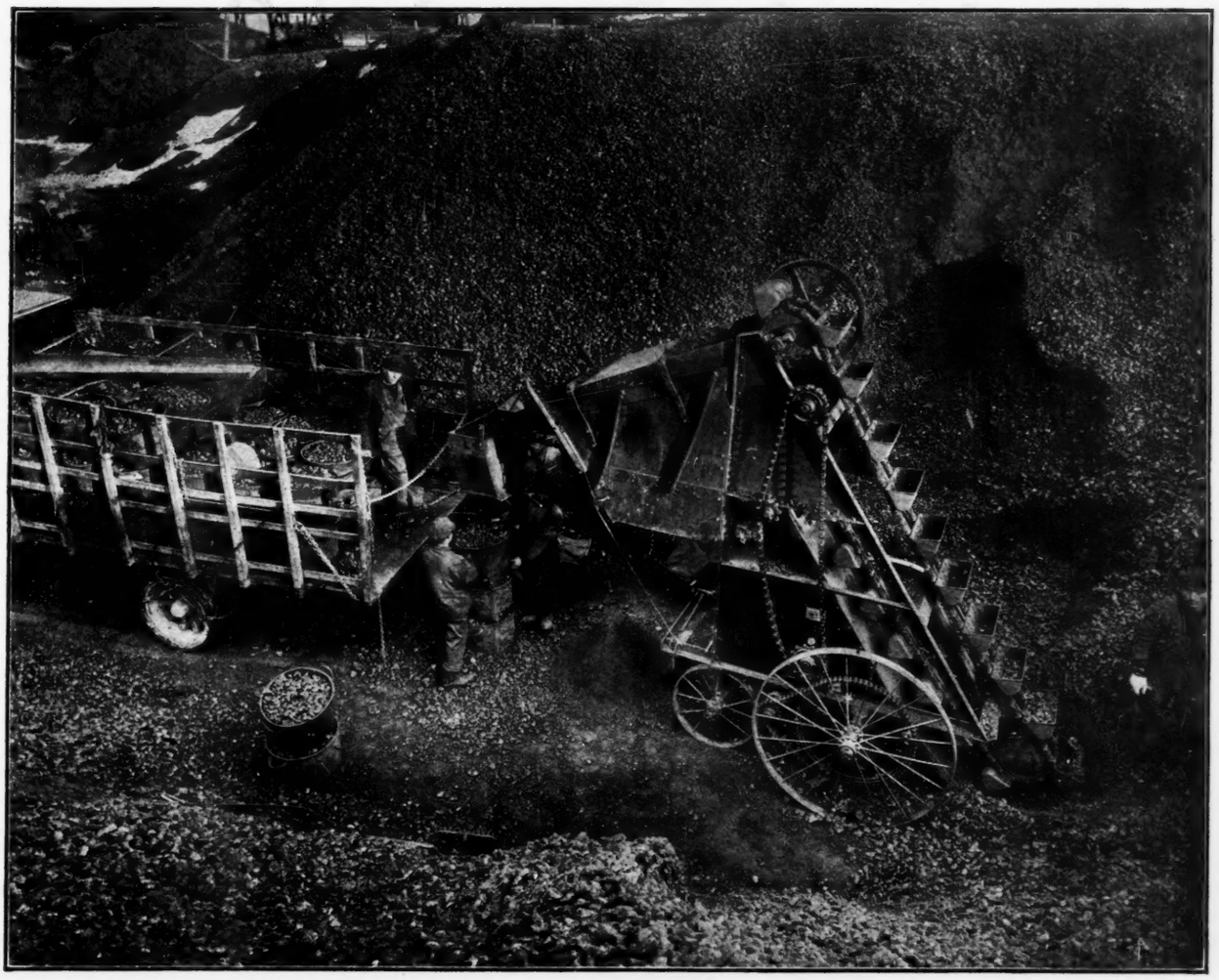


FIG. 2. A SMALLER MACHINE FITTED WITH A BAGGING HOPPER

the ground into wagons or motor trucks. Wagon-loaders are particularly useful for handling gas-house coke because they can be arranged to screen the product as it is delivered. Furthermore, with high wagons and motor trucks it is a hard job to throw coke with forks to the required height.

Another point is that a surprising amount of breeze or fines sticks to coke stored in the open. This cannot be removed by forking. In the domestic sizes the proportion of this breeze often runs as high as 10 per cent., and it needs considerable shaking to get the breeze loose.

To screen coke properly and at the same time avoid breaking it, loaders are now made with shaking screens arranged so as to receive the coke with a short fall from the buckets as they pass around the head wheel and deliver it with a short drop into the trucks. On account of the bulky nature of the product large buckets are necessary to give an ordinary capacity of a ton in one or two minutes, and to insure durability against the grit the chains are often fitted with hardened pins and bushings.

Fig. 1 shows a large loader which has a capacity of one ton a minute and which is fitted with a hopper for screenings. A 7½-hp. motor furnishes the power, and the machine is sometimes made to propel itself. Fig. 2 shows a smaller machine fitted with a bagging hopper, which holds a little more than one bagful of coke.

This machine is used in connection with a large open storage plant, and since its installation it has displaced five men who formerly did the work with forks. Furthermore it delivers coke that is really clean. It does the work more quickly, and when used for loading motor trucks it makes the latter a profitable investment by detaining them in the yard a shorter time and allowing them to be out on the street on delivery service more than formerly. In the yard shown four tons of coke are screened, bagged and loaded in 15 minutes.

On account of the light weight and great bulk of coke, a bin to hold some hundreds of tons becomes quite large and if well-built is comparatively expensive. Storing in the open or under sheds is much cheaper, but the expense of reclaiming and reloading the coke from the ground by forking and screening has in the past been the great objection to such methods.

With the use of the screening loader most of this expense is avoided and the coke can be loaded more quickly and screened much better. As a consequence the cheaper plan of storing coke on the ground has been adopted by a number of coke plants in preference to building bins for storing it overhead.

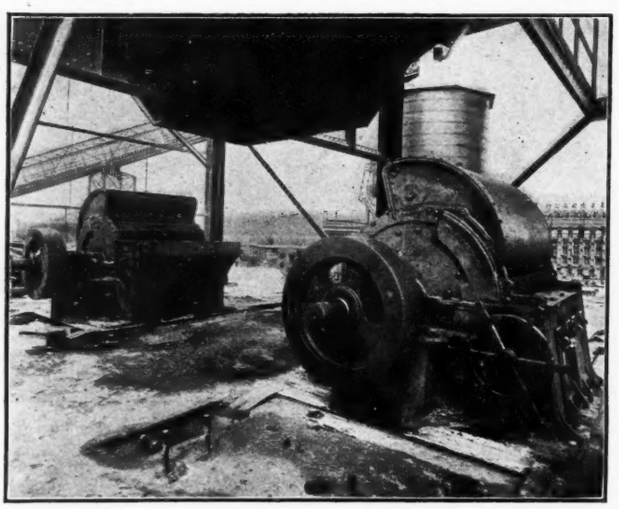
Crushers for Byproduct Ovens

M. J. WILLIAMS*

SYNOPSIS—A description of two of the largest machines ever built to crush coking coal through a ⅛-in. mesh screen. These crushers weigh about 15 tons each and have an hourly capacity of 250 to 300 tons.

The accompanying illustration shows two No. 8 Williams patent jumbo coal crushers installed in the byproduct coke plant of the Minnesota Steel Co., at New Duluth, Minn.

These crushers are intended to pulverize bituminous coal for byproduct coke ovens. The coal is delivered to the storage bin above the crushers in 1½-in. cubes and finer, being broken to this size by Heyl & Patterson Bradford breakers. From the storage bin it passes by gravity to the two crushers, where it is pulverized and



JUMBO CRUSHERS FOR COAL AND COKE

ground to a product 90 per cent. of which will pass a ⅛-in. mesh screen.

These two machines are mechanically interesting for a number of reasons:

1. They are the largest size crushers ever built for reducing coal to ⅛ in. and finer. They will each be direct connected to motors of approximately 350 hp., operating at a speed of 750 r.p.m. The flexible couplings used to make this connection are of the Baehr type, capable of transmitting from 500 to 600 hp. The use of flexible coupling relieves the motor of any shock or stress caused by intermittent loads. It also does away entirely with belts, makes the installation compact and is the most efficient drive possible for crushers of this character.

2. Each crusher is equipped with a metal trap or arrester, so arranged that a large percentage of stray or tramp iron which may pass the magnets located between the storage bin and the crusher is trapped and can be removed at any time without injury to the internal parts of the crusher. These metal arresters are in successful operation on many crushers of this type and never fail to do the work. They are practically fool-proof.

3. Each crusher is equipped with an $8\frac{15}{16}$-in. shaft, which runs in self-oiling dynamo bearings. These are dust-proof, self-lubricating and remain clean and cool at all times.

4. Each crusher is equipped with cast-steel disks carrying the hammers, with a series of six adjusting holes. These permit the operator to "let out" these hammers as they become worn, ½ in. at a time until 3 in. is worn off the hammer end. This amount of wear ends the usefulness of the hammer. With this adjustment all the available stock in a crushing hammer may be used.

5. Each crusher is equipped with an adjustable breaker-plate and front end. The operator may adjust this plate in toward the revolving hammer from $\frac{1}{32}$ in. up to 2 in., or any distance desired between these limits. Such an adjustment may be made while the machine is in operation.

6. Each crusher is fitted with a Williams adjustable dumping cage, which may be adjusted up toward the hammer any distance desired to compensate for wear, while the entire cage may be dropped or dumped into the discharge chute under the machine at any time. Dropping this cage relieves the crusher from uncrushed coal in the event of a fuse blowing. The failure of a fuse would stop the crusher, and unless the feed to it is cut off simultaneously with the stoppage (which can never be done), the machine will load up with uncrushed coal and cannot be started again until this is removed.

To clean out a crusher under ordinary conditions requires opening the machine and working the coal out by hand. This takes from one to three hours, depending upon the men and the conditions under which they are working. With the Williams dumping cage, however, when such a choke-up occurs, the operator merely releases a pawl engaging a ratchet wheel which is placed outside the crusher, and the entire cage by its own weight drops and discharges all the uncrushed coal through a bypass chute. The turning of a handwheel then raises the cage to its proper position, and the machine is again ready for operation.

The dumping cage is fitted into a cast-steel sub-frame, hinged or pivoted at the front of the crusher. The rear end of this frame is fitted with special steel chains which engage sprockets on a countershaft, the actuating mechanism of which is spur gears and a substantial pilot wheel on the outside of the crusher. The ratio of the gears is such that one man may easily raise the cage to its normal position. The operation of discharging the contents of the crusher, as described, and of bringing the cage back to its proper place is the work of from two to three minutes for an experienced operator. This operation may be made necessary, not only by the blowing of a fuse, but may result from any other stoppage cause.

7. Each crusher is built up in sectional construction, and although each machine weighs 15 to 16 tons, any part may be replaced at any time without disturbing the rest of the crusher, the heaviest individual part not weighing over 1500 lb. It is readily apparent, therefore,

*Williams Patent Crusher & Pulverizer Co., Old Colony Building, Chicago, Ill.

that replacements are easy and that the cost of any individual part is comparatively small.

The general construction of these crushers presents some interesting features, such as large doors at the back and front of the machine by which from two to three men may freely enter the chute under the crusher and not be crowded. The hopper opening into each crusher is 2x5 ft. Each machine will easily handlle from 250 to 300 tons of coal per hour, crushing it to a product 90 per cent. of which will go through a 1/8-in. mesh screen.

These crushers are approximately 13 ft. long over all, 11 ft. wide and 6 ft. high. They are set upon steel I-beams embedded in a large concrete foundation at an elevation of approximately 15 ft. from the track or ground level.

Improving the Beehive Output

By H. S. Geismer*

SYNOPSIS—Byproduct ovens possess many advantages over those of the beehive type. To offset these advantages and to produce a product that can compete in the market with byproduct coke great care and attention to minute details are necessary in the manipulation of the beehive oven.

There are in the United States today a large number of idle batteries of beehive coke ovens, and some of the owners are beginning to wonder if they will ever be able to put them in blast again. In some instances their worst fears are well-founded. Because of the present high prices on all coke-oven byproducts there are practically no idle by-product ovens in the country, and in consequence the sale of byproduct coke is being pushed, and a goodly number of foundries and furnaces are using this fuel almost exclusively, or at any rate in larger proportion than ever before.

Whether they will ever go back to beehive coke (assuming of course that they can always obtain a sufficient supply of the byproduct variety) will depend on the results they obtain with the byproduct coke now being furnished. If their former coke supply was obtained from a beehive-oven operation that produced a coke of variable quality—and there have been only too many such operations in the past—it stands to reason that they have learned now what uniform quality in one's coke supply really means, and they will go back to beehive coke under protest, since any byproduct plant furnished with a uniform quality of coal can be depended upon to produce an equally uniform quality of coke. If, however, the results obtained from the two varieties of fuel show little variation, the question of returning to beehive coke will depend largely upon the future selling price of the two grades.

Some half-dozen years ago in taking charge of a group of mines and furnaces I found myself called upon to decide between the possibility of improving the quality and cutting the cost of the beehive coke produced at one of the operations or abandoning that operation. The investigation that resulted was similar to the inquiries that will have to be carried on at many existing beehive-oven plants if they are to successfully compete with byproduct ovens now reaching out for business in their territory. A short account, therefore, of what was accomplished and how it was accomplished may prove of interest.

No originality is claimed for the method used nor for that matter is any great originality required with most efficiency tests. It is largely a question of arousing the interest of the management to a point where it will pry into the details.

Cost Sheets were first Studied

First, a careful study of the cost sheets of the previous management was made, from which it at once became evident that the high cost of coke was due principally to the low yield from the ovens, 50 per cent. being the average. Careful analyses of the coal used threw no light on this low yield.

Next, inquiry was made at the furnace where the coke had been consumed to find out if possible why this fuel had been given such a bad name. The result of this inquiry showed that the ash content of the coke, as delivered at the furnace, was exceedingly variable, and as a result the furnace worked irregularly when burdened entirely with it. Careful analyses of the ash derived from the coke showed that it ran high in alumina, and this probably aggravated the irregular working of the furnace, when the percentage of ash in the coke was excessive or above what would be expected from average coke of high variable ash content.

This variable ash content indicated a lack of proper supervision in operating the ovens or in the preparation of the coal or a combination of both. Thus all of the evidence obtainable from the records indicated that mismanagement at the ovens might be responsible for the poor showing that had been made by the operation.

The investigation was now carried direct to the ovens, and close inspection was made of every step in the operation from the time the coal was loaded into larries for the ovens until the finished coke was forked into railroad cars. It became evident at once that a number of circumstances contributed to the low yield of coke.

The coal used was washed before being sent to the ovens, and as the bin capacity at the washer was small it often happened that the coal was taken from the bins before the water had time to drain out. When this happened the larries might contain as much water as coal, and the oven bottoms were consequently flooded and chilled. As a result these ovens were slow to flame and they did not burn in on time.

If the coke-puller who was in charge of the particular oven that had failed to burn in on time got impatient, he might punch a few holes in the oven door to hasten its burning in. This necessarily meant that a considerable quantity of coke would be burned up in the oven before being pulled. Not satisfied with this, the puller would often pull the oven before coking was complete, occasioning further loss as well as a poor quality of coke.

*Keiser-Geismer Engineering Co., Birmingham, Ala.

Labor was scarce, and if a puller was reprimanded too severely for pulling an oven before it was burned in, he might walk off without pulling the oven, and the chances were that it might have to stand anywhere from three to six hours before it could be pulled.

The Weight of Coal Charged Varied

Another direct result of the variable water content of the washed coal was a considerable variation in the actual weight of coal in each of the larry charges. This meant that the ovens could not be depended upon to deliver the same quantity of coke from each charge nor could they be depended upon to burn in at regular intervals.

Again it was found that the man in charge of the larry stood in with some of the coke pullers and would put small charges in their ovens, thus relieving them of some of their labor without reducing their earnings, as they were paid by the oven and not on a tonnage basis. Ovens with these light charges often burned in before the pullers reported for work, and if not properly drafted they burned up part of their charge.

It took several weeks of close supervision to inaugurate a system which insured uniform oven charges and a fixed coking time for each charge, but when these were obtained the output per oven per day became a dependable quantity.

Only one condition that contributed to the low oven yield was beyond the control of the coke-oven management—the coal as delivered to the oven contained a considerable quantity of "mother coal." It was found that this "mother coal" produced a coke that was very friable, and a good deal of it was broken up into breeze while being handled on the yard. Because the blast-furnace management regularly raised a howl about the importance of screening out more of the fine stuff, which howl was often well-justified, the coke loaders were cautioned to fork the coke carefully on the yard. In doing this, they broke up a considerable quantity of the friable coke, and this also had its effect on keeping down the yield from the ovens. This trouble was later largely overcome by adopting strict dockage rules at the mines governing the loading of "mother coal."

What Would be the Result of Careful Manipulation

A test was next decided upon to prove just what the ovens could be expected to do if properly handled. Ten ovens were chosen, and for a ten-day period they were given close personal supervision. Each larry was carefully inspected before being discharged to see that it had the exact amount of coal and also that the moisture content was not excessive. The drafting as well as the time of charging and drawing was given the closest attention, and each charge of coke before being loaded into railroad cars was carefully weighed.

It was found that these ovens gave a uniform yield of 59½ per cent. of good quality coke, after screening out all the fines that any reasonable blast-furnace manager could class as breeze.

Profiting by the experience gained with the test ovens, rigid rules were adopted for the entire battery, and the results were most astonishing. The yield of coke from the ovens, taking railroad weights as the basis, jumped up to 57½ per cent. The ash content of the coke was also reduced considerably and remained fairly uniform.

The net result was that the cost of the coke was brought down to where it could be put on a competitive basis with the most favored ovens in the district, and the quality became such that it could be used in blast furnaces without the uncertain result that had previously so often upset the management. Not only that, but the total quantity of coke produced by the ovens began to increase considerably, and after reaching the maximum remained practically uniform while previously it had varied greatly.

The most gratifying feature, however, to all who took part in the test was that all of the improvement had been brought about without making any changes in the ovens or in the oven equipment. Neither were any material changes made in the working force.

The total cost of coke at any beehive-oven operation is dependent upon so many apparently insignificant details that it is difficult to make the man in charge of the mines realize the importance of carefully digging into all of them. Nevertheless it is only at plants where all of the details are carefully inquired into that satisfactory cost sheets can be found. And furthermore, strange though it may seem, in most cases the best quality of coke is secured when the coke-oven cost is reduced to a minimum.

Coke-Oven Accidents

The United States Bureau of Mines will soon issue its first report detailing the coke-oven accidents in the United States during 1913 and 1914, as compiled by Albert H. Fay, mining engineer. The investigation includes the returns from 275 active plants in 1913 and 253 in 1914 and shows that 96 men were killed, 644 seriously injured and 4059 slightly injured. These plants employed 24,345 men in 1913 and 22,313 men in 1914. The death rate for each 1000 employed was 1.89 in 1913 and 2.02 in 1914.

Mr. Fay says: "The number of coke establishments in 1913 was 551, with a total of 102,650 ovens. The bureau's report embraces 82 per cent. of the ovens. A number of the plants operated only a portion of their ovens, so that the total number idle includes more ovens than are represented by only the idle plants. While the accident figures collected are not complete for the entire industry, yet they are sufficiently representative to point out some of the hazards of this class of work. No distinction has been made concerning the type of ovens in use.

"The figures show that 37 per cent. of the fatalities resulted from accidents caused by cars, larries and motors; 11 per cent. was due to coke-drawing machines. and a like percentage to electricity and falls of persons. Of the fatal injuries 21.5 per cent. was due to haulage systems and 24.1 per cent. to falls of persons. Of the slight injuries 8.3 per cent. was due to haulage systems, 12.2 per cent. to falls of persons, 14.6 per cent. to hand tools and 14.9 per cent. to burns.

"Since 37 per cent. of the fatalities at coke ovens is due to haulage systems, greater care and precaution should be taken to safeguard employees who operate or work near transportation equipment. Inasmuch as electric haulage is used extensively, a large percentage of the electrical accidents may also be classified with those resulting from haulage systems, or over 40 per cent. of all the fatalities. It is in this department of the coke industry that there appears to be an excellent field for the reduction of accidents.

Coke as a Domestic Fuel

SYNOPSIS—It is pointed out that the markets for coke could be greatly enlarged if the manufacturers of this product would conduct an intelligent educational campaign. Coke is the logical competitor of anthracite since it possesses many of the advantages of the latter fuel.

While coke is used as a domestic fuel, it is only to a very limited extent. The object of this article is to impress upon the manufacturer of coke the golden opportunity that awaits his product as a real competitor in the domestic anthracite market.

Coke has all the advantages of anthracite, and in addition several that the latter does not possess—greater cleanliness, uniformity of quality and, lastly, cheapness when price and results are considered.

Years ago coke as a domestic fuel was condemned on the score that it burned the grates. Of course it did, for the only coke known to commerce at that time was the hard, silvery 72-hr. coke. This is the coke that has driven anthracite from its position of being the chief means of smelting ores, until now practically no anthracite is used for that purpose. Furnace coke was only intended for this one purpose, that of creating intense heat, and when tried as a domestic fuel it isn't any wonder that it ruined stoves.

Times have changed and the fuel business also, and now with the introduction of the byproduct coke oven we are getting a fairly satisfactory coke for domestic use, but even now the market for such coke has been merely touched. Much of the original prejudice against coke still persists and must be swept away before any real progress can be made. Fortunately there is a way for those with an open mind.

Coke the Poor Man's Fuel

At this time coke occupies the position of the poor man's fuel—the fuel for him who can spend but 5 or 10c. at a time. Yet while it is the poor man's fuel, the user nevertheless is getting more for his money and is at the same time enjoying a luxury somewhat akin to that of our colored brethren who for years were the chief consumers of bacon, until their white brothers awakened and by improved methods of preparation and exploitation on the part of the big packing companies, boosted the price 10 to 15 times what it was formerly.

While no one can expect such an increased price in coke, the only desire being to find a wider market, yet a lesson can be taken from the bacon story in encouraging coke manufacturers to give the needed attention in the way of adapting coke preparation to meet all conditions, together with a proper exploitation of its virtues as a fuel.

Being entirely a manufactured product the preparation of coke is in the hands of the maker and should not be the result of chance. In a way the use of coke for a domestic fuel was almost as much an accident as was the first use of anthracite. The first acquaintance the public had with it as a domestic fuel was brought about by the gas companies about 40 years ago. In making their gas they produced as a byproduct a 4-hr. coke and this was sold cheaply to a limited trade at a very low price to get rid of it. Yet even this coke fully met all the requirements of an ideal domestic fuel.

Coke vs. Anthracite

To those in the Eastern States who have had an opportunity to compare the two fuels, coke and anthracite, in actual burning tests in ordinary domestic use, there is not the least doubt that coke not only does as much but more than anthracite. However, only a comparatively few realize this, and it is up to the manufacturer of coke to create his market, along lines similar in a way to those by which the manufacturers of gas created one for their product, which developed from a mere illuminant until now it is an active and extensive competitor of all domestic fuels.

For years the anthracite producers have been allowing the gas companies to take their market from them—not that the anthracite tonnage has not increased, for it has, but not in proportion to the growth of population. As the result of this lack of real activity on the part of the anthracite interests the hard-coal trade has been put on its back helpless for four months of every year.

There is not a bit of doubt that much of this trade could have been held by the coal companies had they made any effort at all. As an illustration of the loss of trade it is interesting here to mention the experience in one town. The community in question is 70 miles from the anthracite region and of the 5000 homes there contained, over 1000 did not even have a gas range in them. This is not an isolated instance, for similar conditions may be found in any important community. In the community referred to, besides losing the summer tonnage, the winter demand for anthracite has gone as well, and 90 per cent of it was lost because no effort was made to keep it. The remarkable thing is that all this has taken place despite the fact that gas never was nor ever will be as cheap as coal. The gas companies are simply making the most of their opportunities by dwelling on the favorable aspects of their product and continuously hammering away.

This case is only recited here to prove to the coke manufacturer that, with all the favorable qualities possessed by his product, there must surely be a wide market for it, but it is going to take more than merely saying coke is better than anthracite—he must prove it to the people he wishes to reach; and here in small compass is one man's idea as to how a start can be made.

How to Popularize Coke

Know your product. Being a manufactured substance its quality so far as uniformity is concerned is within your control. It is also absolutely necessary to know what your fuel can do under all conditions. For instance, does a 4-hr. coke meet all the requirements of an ordinary heating stove? Is a different kind required for the cook stove? What size acts best in each? How about the results in steam-heating plants? Will the same kind and size of coke as used in ordinary stoves do for steam, hot-air, or vapor heating plants? It is not at all likely that it will, but it is your business to know. You should know exactly what your fuel will do, and

after all of these factors are determined you are prepared to go intelligently after your market.

In seeking an outlet select the most progressive dealer you can find in a town. It goes without argument, of course, that you must make your proposition attractive to him, but you will find he will meet you more than half way if he finds you are responsible and in earnest. Then have your people thoroughly instruct him as to the method of firing the different stoves and heating systems so he can educate his customers. Better still, establish an exhibition plant on a main thoroughfare, with various stoves in operation and show the public the advantages of coke by actual demonstration, which, together with judicious advertising, will prove to them what they are missing in not using the best fuel obtainable.

Of course you will say this is an expensive proceeding. Without a doubt it is. So was the process of the gas companies in educating the public to their way of thinking. Every one knows how the gas companies simply lingered along for years until a man with a new idea came forth.

To a much lesser degree the coke industry as a factor in the domestic market must blaze its path. Then only will it get a full measure of the domestic trade that inherently belongs to it.

That it pays to spend money to make money has had no better demonstration than the experience of the selfsame gas companies as proven by their earnings today. As much or more in proportion can be done for the coke industry if the producing interests really want a share of the domestic coal trade of the East, which amounts to about 70,000,000 tons yearly. It rests entirely with them and the proportion they get will be determined largely by the fact of how much they want the business.

Need of Competent Chemists

With the establishment and rapid growth of the byproduct coking industry in the United States, there comes the necessity of having competent men to carry on researches into the problems associated with the carbonization of coal.

Participants in this particular branch of industry will sooner or later be confronted by economic problems in the production and quality of their output which will require solution through efficient chemical and physical research at the hands of technically trained men. In other words, conditions will soon require more than the ordinary plant routine tests now mostly carried on by laboratory boys and men, some of whom have little if any chemical training.

The raw coal must be thoroughly investigated so as to determine which particular grade or mixture gives the greatest yield of byproducts. The process of carbonization itself must be intelligently studied from a scientific standpoint, getting away from the rule-of-thumb methods of dumping the coal into the ovens and trusting to luck for results. The treatment of the byproducts requires scientific skill so as to bring out the greatest yield of ammonia, tar, gas, etc., per net ton of coal. To improve the regulation and mechanical parts of the processes is also within the sphere of the chemist.

A Field for Study

The abstraction of benzol and its derivatives from the coke-oven gases will also afford a field for much study in the future, and if this country is to compete with others along these lines money must be appropriated and spent in scientific study and investigation for the advancement of this industry. American carbonizers have been slow to grasp this idea of chemical research, while the few that have lent an ear to it have not had the patience to wait for manufacturing improvements and results. The problem of a chemical process cannot always be solved in six months; it may take years. Accordingly the manufacturer is somewhat reluctant to spend money for something that does not yield an immediate return.

To properly promote the advancement of this great industry, as yet in its infancy so far as America is concerned, but which no doubt will be ultimately highly remunerative, there must be employed technically trained men, at a compensation commensurate with ability, to value the raw materials, produce high-grade products, suggest the utilization of the various substances and control the processes, also to carry on preliminary experimental work on byproducts which are now going to waste and which will eventually be recovered at a profit.

Ballads of a Coal Miner--II

By Berton Braley

Here I am now with my lamp an' my pick
Ready an' willin' to start on my trick,
Primed for the kind of a job I must do—
One of the underground crew.

Ready to ride on the rackety cage
Down to the room where I'll sweat for my wage,
Dusty and grimy an' sooty to view—
One of the underground crew.

Down in the depths in the blackness and murk
Down where the dust an' the gases may lurk,
Down where the chances is—well, not so few—
One of the underground crew.

Folks must be warm an' the engines must turn,
There must be coal for the boilers to burn;
I've got to labor to bring it to view—
One of the underground crew.

Somebody's got to be sweatin' down there, far from the sun an' the pleasant fresh air,
Somebody's got to—an' so it's my cue—one of the underground crew.

Problems in Successful Coking

By F. S. Johnson*

SYNOPSIS—A short résumé of the coking industry in the United States, together with instances showing that in order to secure good coke it is sometimes necessary to pay careful attention to methods of mining. Carelessness underground often results in inferior coke.

The early history of the coke industry is somewhat vague, and various authorities disagree as to the date of its beginning. According to Fulton, coke is known to have been used successfully in Shropshire, England, as early as 1735, but was not employed extensively as a blast furnace fuel until 1750.

The first positive knowledge we have of its use in America was in 1817, or about 30 years after the close of the Revolution, when the expansion of the iron industry had made it necessary to seek a cheaper fuel than charcoal, which up to this time had been used exclusively for blast-furnace operation.

Practically all that is known of the manufacture of coke in the United States between the years 1817 and 1825 is a mention of the fact that coke was "made on the ground."

In 1825 a representative for the Society for the Promotion of Internal Improvement in Pennsylvania, who had been sent to England to ascertain the most improved methods of iron manufacture there, submitted a report giving detailed drawings of ovens in use for the manufacture of coke.

This report no doubt resulted in much experimenting, but not until 1841 do we have any authoritative knowledge of the use of coke ovens. This is obtained from the report of J. D. Weeks on the manufacture of coke in the United States in the census year of 1880, in the form of the following incident, the relator being a Mr. Provance McCormack:

James Campbell and myself heard in some way that I do not recollect that the manufacture of coke might be made a good business. John Taylor, a stonemason, who owned the farm on which the Fayette Coke Works now stands and who was mining coal in a small way was spoken to regarding our enterprise and proposed a partnership—he to build the ovens and make the coke and Mr. Campbell and myself to build a boat and take the coke to Cincinnati, where we heard there was a good demand. This was in the year 1841. Mr. Taylor built two ovens. I think they were about 10 ft. in diameter. My recollection is that the charge was 80 bu. The ovens were built in the same style as the ones now used, but had no iron ring at the top to prevent the brickwork from falling in when filling the oven with coal, nor had we any iron frame at the mouth where the coke was drawn. The top and mouth had to be repaired when they fell in. In the spring of 1842, enough coke had been made to fill two boats—about 800 bu. each—and we took them to Cincinnati down the Youghiogheny, Monongahela and Ohio, but when we got there we could not sell. Mr. Campbell, who went with the boats, laid at the landing some two or three weeks, retailing out one boatload and part of the other in small lots at about 8c. a bu.

Miles Greenwood, a foundryman of that city, offered to take the balance if he would take a small patent flour mill at $125 in payment, which Mr. Campbell did. He had it shipped here. We tried it, but it was no good, and we sold it to a man in the mountains for $30. This ended our coke business.

Although this attempt at coking coal in ovens proved rather discouraging, a slow growth continued as is evidenced by the fact that in 1859 the Fayette Coke Works constructed a battery of 30 ovens.

Coke Making Has Kept Pace With Steel Making

It would be interesting to trace the growth of the industry from the coke "made on the ground" requiring from 5 to 10 days for complete carbonization, depending on weather conditions, with a 50 per cent. yield, to the last word in byproduct ovens, where the time of coking and the yield are almost optional. But to do this would necessitate a like treatment of the iron and steel industry, upon whose growth the coke industry is almost entirely dependent. However, when we consider that at the end of 1913 there were 575 coke-making establishments in this country, distributed in 24 states, with over 100,000 beehive and over 5000 byproduct ovens, we can appreciate the great progress made in the 50 years following the building of the first 30 ovens in Pennsylvania.

While this phenomenal growth is something of which to be justly proud, there is yet much to be desired in the coke industry of this country. The same figures showing this wonderful expansion also reveal the ratio of beehive to byproduct ovens to be 20 to 1 and mark us as the most extravagant of peoples in the exploitation of our natural resources.

At a byproduct plant in Great Britain recently, experiment showed that from every ton of coal charged there was obtained from 12 to 15 cwt. of excellent coke, which sold in the market for $7.50 per ton; also 30 lb. of ammonia, which sells for $63 per ton, 100 lb. of tar at $8.50 a ton 2½ gal. of benzol worth 60 cents and 5000 cu.ft. of gas. All of this would have been wasted had beehive ovens been used, with the exception of the coke, and in that case the yield would probably have been much less.

To show more accurately our extravagance and wastefulness from this source we may take the statistics compiled by the Bureau of Mines for the year 1913, in which our own market conditions, etc., are taken into consideration.

Of approximately 570,000,000 tons of coal mined in that year, 75,000,000 tons, or 13 per cent., was used for making coke and gas. Had all of this coal been coked in byproduct ovens, the higher yield of coke would have increased its value $10,000,000, while $80,000,000 worth of byproducts would have been recovered. In other words, there was wasted in the coke industry of the United States in one year $90,000,000.

Byproduct Ovens Give an Increased Yield

While this condition of affairs is usually condoned by the great difference in the initial cost of the ovens and the sometimes inferior quality of the coke produced in the byproduct process, these facts are not sufficient to justify the present procedure, as the following results given by various investigators will prove.

In beehive ovens, Pocahontas coal containing 18 per cent. of volatile matter gives a yield of 62 per cent. of coke. In Semet-Solvay ovens, the same coal yields 85 per cent. of coke. Connellsville coal containing 32 per cent. volatile matter yields in beehive ovens 64 per cent. of coke and in Semet-Solvay ovens 72 per cent. of coke. Considering the comparative cost of the two types of ovens on

*Coalton, W. Va.

these figures alone, the surprising cheapness of the byproduct oven is shown. The chief objection formerly raised to byproduct coke was its dark color, produced by watering outside of the oven. This of course was nothing more than a prejudice on the part of the foundrymen, which is rapidly being dissipated, as is evidenced by the large corporations that are increasing their byproduct plants and using more and more of this fuel each year.

While considerably more skill is required for the successful operation of byproduct ovens than for those of the beehive type, there are certain fundamental precautions to be observed in mining and preparing a coal for coking which are equally essential to both types.

Physical Structure Is Improved by Coal Crushing

Every experienced coke maker knows the benefit derived in the physical structure of the coke from a fine crushing of the coal, making a lighter, more uniform and stronger product. While this advantage is generally recognized, it does not by any means solve the question from a chemical standpoint, and additional methods of treatment are frequently required, varying with the composition of the coal and the condition in which the impurities occur.

It is not the intention of this paper to go into the merits of the various coal-cleaning equipments upon the market today. On the other hand, it is well worth while to mention one or two things which frequently escape the notice of the average coke operator and which sometimes play havoc with the quality of his product.

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Investigations concerning the method and time of burning proved that everything was normal in these respects, so that inquiries were directed to the inside of the mine, where it was soon discovered that because of the slate and sulphur partings being confined to the upper portion of the breast coal little breakage occurred during mining and the impurities remained in the larger grades, being removed by the trimmers in passing over the screens. Consequently these impurities had not affected the coke while the slack alone was being used, but caused trouble when the run of mine was crushed for coking.

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H. H. Clark, of the Bureau of Mines, opened the afternoon session with his paper on "Portable Electric Mine Lamps." He informed the institute that the bureau has added serviceability specifications to the usual safety requirements. These must be met before a lamp is "approved."

The paper by Josiah Keely on "Prevention of Mine Accidents" was minus the burden of statistics which we have come to expect when hearing this topic discussed. He contrasted the savagery in Europe, where the slogan is "Slaughter first," with the attitude of the operator, whose watchword is "Safety first." Mr. Keely presented some of the difficulties confronting the official who labors along humanitarian lines. It is not to be expected that large sums can be appropriated for welfare, sanitation and accident prevention when profits in the coal business are reduced to the vanishing point. Comment was made on the indifference of the workman to the dangers which beset his occupation and to the antagonism often encountered from the miner's union when an attempt is made to enforce discipline and the mining law.

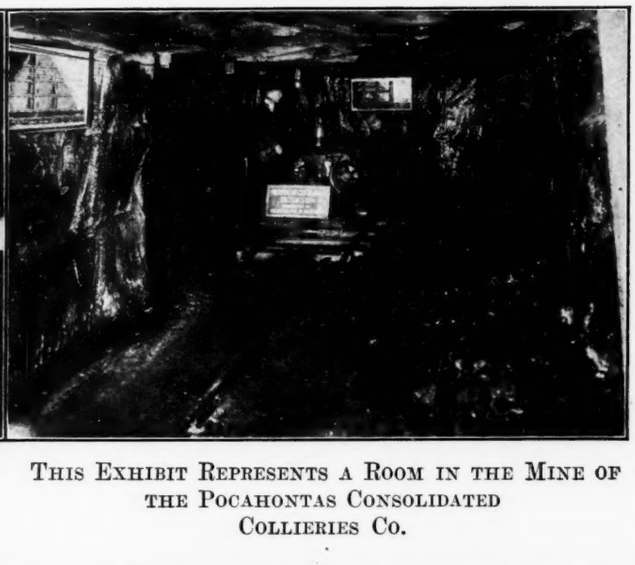
The question-box session was devoted to workmen's compensation, mine cars, welfare work and gathering locomotives, and the time provided proved to be far too short to do justice to the topics discussed. The meeting adjourned with a vote of thanks to the good people of Wheeling for the entertainment provided.

Bureau of Mines Panama Exhibit

One of the most interesting features of the exposition in San Francisco is "the mine," located under the floor of the Mines and Metallurgy Palace. The attendants in charge of this exhibit are actually experienced mine workers.

There is a main haulageway in this imitation mine, in which operate Westinghouse electric trolley and storage-battery locomotives. Metal-mine cars are used in the metal-mine section and coal-mine cars in the coal-mine section. Explosives are handled in safety magazines loaned by the Hercules Powder Co. In the pumproom, compressor-room and hoistroom the visitor will find all the modern machinery designed to fulfill pumping, power and hoisting duties.

EXHIBITS OF JEFFREY MANUFACTURING CO., FAIRMONT MINING MACHINERY CO. AND CONSOLIDATION COAL CO.



THIS EXHIBIT REPRESENTS A ROOM IN THE MINE OF THE POCAHONTAS CONSOLIDATED COLLIERIES CO.

E. I. DU PONT POWDER CO.'S BOOTH

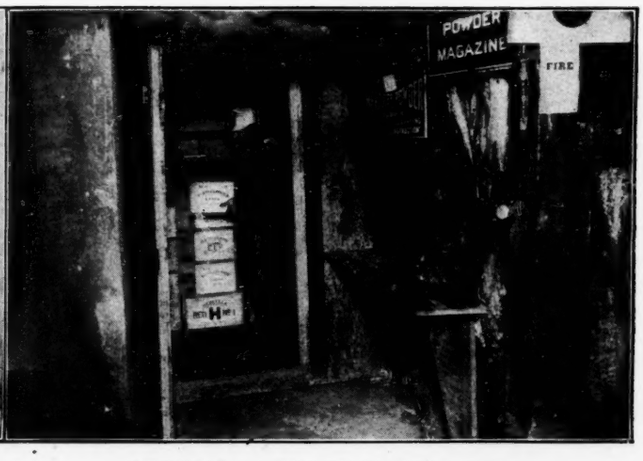
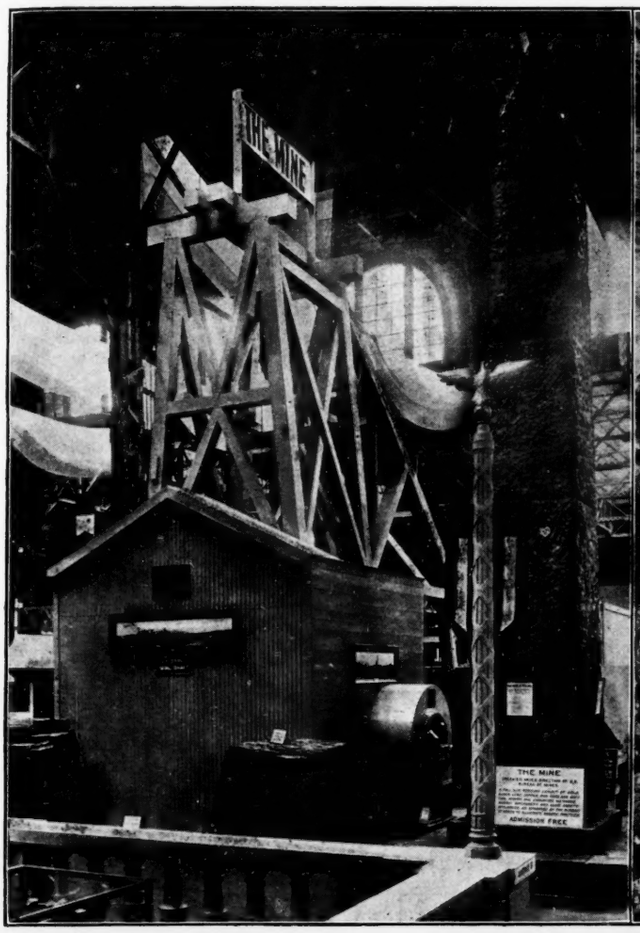
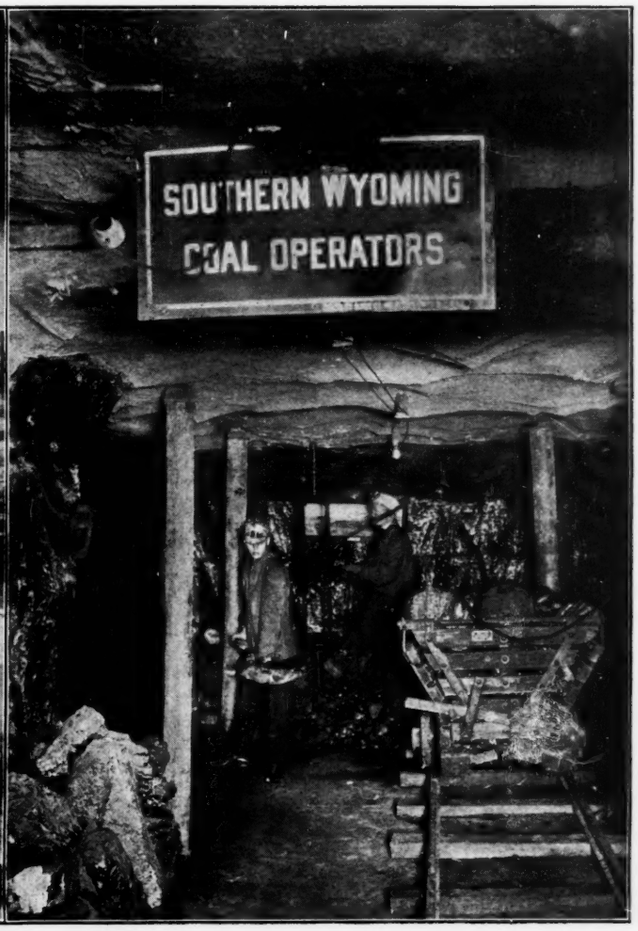


EXHIBIT OF HERCULES POWDER CO.



SHAFT ENTRANCE TO "THE MINE"



DISPLAY OF SOUTHERN WYOMING OPERATORS

There is a foreman's office, with the usual maps and other paraphernalia, an underground first-aid station and an underground surveyor's station with instruments. The coal-mining rooms and the metal-mining stopes are exact reproductions to close scale of those they represent, including the methods of timbering.

The popularity of "the mine," enhanced by the spectacular mine explosions, with accompanying first-aid demonstrations, is such that the number of visitors is so large that the attendants find it difficult properly to handle the crowds and at the same time demonstrate the exhibits.

The Labor Situation

SYNOPSIS—The union in West Virginia has made progress under Thomas Haggerty's administration. The Ohio referendum canvass will cost about $60,000 and may be abandoned. Hocking Valley operators are declared to be about to shut down indefinitely. The coöperative system in Illinois is strongly opposed by union men. More night-riding occurs in western Kentucky.

Apparently C. J. Albasin, the district president of the eastern Ohio miners, is not the only labor leader with a fight on his hands. Thomas Haggerty, member of the International Board of district No. 2 (central Pennsylvania), finds the central West Virginians disposed to split and to disparage his services. In a long manifesto he reviews his work, as he sees it, since November, 1912, when he first visited the field for a short time, to return for a longer stay in January, 1913. He states that there were only 1376 members of the union in the Kanawha field at that time, whereas there are now 7500 members. Two years ago there were 48 unions, whereas there are now 310. There were then 21 coal companies that signed contracts with the union; now there are 127 so signing. Mr. Haggerty says that the guard system is abolished, wages are raised 14½ per cent., the checkoff established, a 9-hr. day introduced, a semi-monthly pay secured and checkweighmen provided on all tipples. Thomas Haggerty has been accused of using the funds of the union to secure the election of L. C. Rogers and his associates. The committee of the International Executive Board has completely exonerated him and the men elected.

Ohio Referendum Canvass Apparently Too Expensive

In Ohio it appears to be doubtful whether anything will be done to dispossess the Gallagher amendment to the Green anti-screen bill. The union begrudges any expenditures after its long and expensive strike campaign and discovers that the canvass for the referendum petition by which it purposed to upset the Gallagher amendment would cost about $60,000. The officials are loath to spend such a large sum.

The Ohio referendum law provides that petitions of that character must have at least 46,000 signers and these must live in 45 counties of the state. Only 28 counties out of the 88 in Ohio produce coal, and 7 of these produce it in negligible quantities. For this reason the petition will have to circulate in many counties having no coal.

About 1 in every 100 of the 4,767,121 inhabitants of Ohio will have to sign the petitions, and if the canvass is restricted to 45 counties the proportion of signers must be even greater. It is well to remember in this connection that only a small proportion of the inhabitants of Ohio have votes and therefore can sign the petition. Moreover, the farmers are by no means pleased with the long strike and believe that the miners should have accepted the operators' proposition, and in any case they would be disposed to avoid putting the state to the expense involved in a referendum.

A definite announcement will be made about a week hence by John Moore, president of district No. 6, comprising the mining

region of Ohio. The proceedings must be hurried as the law allows only 90 days' time for action after the passage of the bill.

The Sunday Creek Co., alleging that it has been betrayed by the eastern Ohio settlement, has closed its mines and its company stores in the Hocking Valley and will supply its orders from its West Virginia mines. The company declares that the new schedule in the eastern Ohio mines is 5c. per ton lower than it would have been had the only change made in that scale been to make the rate of mining 47c. per ton for machine-mined run-of-mine coal. The assertion is tantamount to a declaration that the new scale in the eastern Ohio district is about 2½c. per ton lower than it was before the strike. The miners in the Sunday Creek region are in dire straits, as they can obtain no credit from the local merchants.

Coöperative System is a New Method of Reducing Wages

The coöperative system is making much trouble in Illinois. On May 13 Thomas T. Brewster, president of the Coal Operators' Association of the Fifth and Ninth Districts of Illinois, wrote to Frank Farrington and the State Executive Board of the United Mine Workers of America protesting against coöperative mining. The men at these mines are paid the union scale less the pro-rata losses of operation. The result is practically an evasion of the scale, and Mr. Brewster threatened to demand a new contract.

The miners' union does not like this form of coöperation any better than the operators. The men who are practically working for less than union wages are getting steady work while others who are employed at noncoöperative plants are working short time. On May 20 Frank Farrington addressed a strongly worded letter against such coöperation to the officers and members of District 12.

Winkle, in Perry County, Ill., is one of the important centers of the coöperative plan, and the Bald Eagle Mining Co. is one of the companies. There has been trouble between the miners who work for the company on a coöperative basis and those who object to such a plan. Threats have been made, and Sheriff Charlton of Perry County has sent deputies to the plant and seized all the weapons he could find in the hands of both factions. The mine is located at Craig, Ill., and in 1913 there were 120 miners employed.

The United Mine Workers of America in Muhlenberg County, Kentucky, have passed resolutions condemning "night-riding" and other violence and declaring that all such acts are in direct conflict with the interests of organized labor.

It is stated that S. F. Cates, a landowner and operator of a small mine four miles south of White Plains, Hopkins County, Ky., has been in Madisonville, Ky., trying to sell his property, stating that he had been severely whipped by "night-riders." He displayed the scars of the whips on his face and reported the attack to the county authorities. He said it was his intention to leave the state as soon as he succeeded in selling his property.

John P. White is scheduled to make 32 addresses in the anthracite region between July 8 and July 29, beginning at West Scranton on the first date and ending the campaign at Shickshinny, Penn.

Byproducts from Coal

The tree appearing in this article was prepared from one made by W. J. A. Butterfield, of London, England, and presented to a conference on the extension of British trade. It shows what byproducts can be extracted from coal in the gas industry. The figures have been changed, as long tons and hundredweights were used in the original table and the gallons used were imperial. Such gallons contain 277.274 cu.in. instead of 231 cu.in., which is the capacity of the American gallon. The imperial gallon is therefore 1.20032 times as large, but as the ton taken by Mr. Butterfield was 1.12 times larger than the short ton the figures were increased by multiplying by 1.07171.

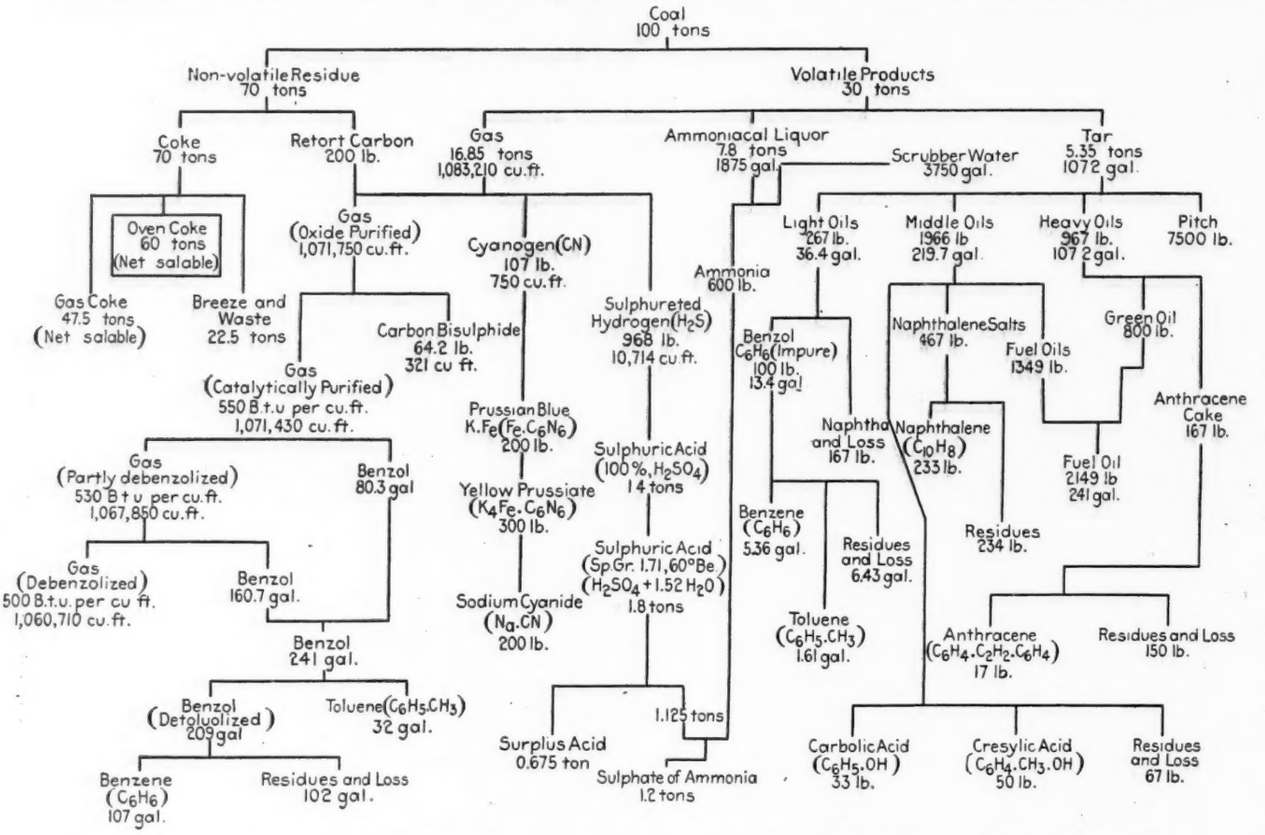


TABLE SHOWING THE VARIOUS BYPRODUCTS OF COAL WITH SOME FEW OTHER BODIES CHEMICALLY COMPOUNDED FROM THESE BYPRODUCTS

Of course sodium cyanide, yellow prussiate and prussian blue are not direct derivatives from cyanogen. The figures given are those obtained in practice. Theoretically every pound of cyanogen makes 1.88427 lb. of sodium cyanide, 2.3599 lb. of yellow prussiate and 1.96661 lb. of prussian blue.

Editorials

The Climate of the Mine

At the close of the Eighteenth Century people still believed that the sea air was extremely detrimental to health and the well-to-do people went to inland watering-places. It was the day when, in England, Beau Brummel was the prince of dandies and Tunbridge Wells the home of fashion. Gradually the doctors decreed in favor of the sea, and the word watering-place took a new meaning, and Brighton consequently came into the forefront.

The American people, when they followed the British example of taking vacations, took trips to the sea. From the very first they profited from what was even then the general practice in Europe. Today not one in a thousand knows that the doctors ever taught that sea air was dangerous.

Similarly the alleged dangers of mountain air long kept people out of Switzerland. It is quite recently that we have learned that such air is invigorating and not to be feared if the heart is strong, and we are positive today that some people are bettered by the light air of mountain regions.

In like manner night air persisted as a bogy for many years—in fact, till a far more recent period. The people shut it out of their houses in deadly fear that it would subject them to disease. Now we know that the night air is even better than the air of the day because the sun's warmth favors the growth of bacteria and because in all probability at night the descending dew carries with it millions of microbes and dust particles.

Our view of the climate of the mine is also changing slowly. The scientists used to invent something they were pleased to call "mephitic exhalations." They peopled the "damps" of the mine with every kind of evil and represented them as deleterious as those around swampy places. The dangers of the latter we now know were largely microbial and were spread, not by the damps themselves, but by the mosquitoes and flies.

But it must be admitted that the mines in earlier days were not any too desirable from the standpoint of health. The air used to be so seldom changed, the methane was burned out and not swept away from the faces, and conditions were none too good. But the coal mine today is different. The air is coursed rapidly past the working faces. It comes to the mine, in summer, hot and full of moisture. When cooled in the shallow mines the moisture falls and deposits the impurities, and though there is much suspended coal dust it is harmless.

Those "mephitic exhalations"—pardon the term—moreover are more harmful by far to the smaller microbial and bacterial forms of growth than to our larger organisms, just as water which is harmful to fish has no observable effect on man.

Perhaps the time will come when we will believe the mines the most healthful of places. They seem to agree well with the mules that live in them from year to year and never come to the surface. It may be permissible also to add that the sterilizing effects of their waters largely prevent blood poisoning in those who may be injured. We are slowly beginning to realize that the worst habitat for man is the factory, the saloon, the theater, the church, the school and the home and other places where people can infect one another and where they are apt to shut themselves in. In cool mines, with good ventilation, the conditions for health are at their best. "The evil that men do" to their health comes after they leave the mines.

Carlyle, Bryan and King

We owe a debt to Mr. Bryan for quoting the following lines from Carlyle in his letter to the people entitled "The Causeless War." That debt is the greater because his quotation raised havoc with his argument. If the elected representatives of the people of any country cannot bind the people of that country, surely Mr. Bryan cannot derive any hope that the chancelleries of Europe can effectually bind those they even less closely represent.

We have little faith that the legislation of representatives truly exhibits the contemporary judgment of the public, but surely the actions of parliaments are more in accord with the popular will than the actions of chancelleries, which in many countries lay not the slightest claim to be representative and which even in our country, checked as their actions are by the Senate, are sometimes found to be strangely out of accord with the national intentions.

For instance the agreement about the Panama Canal made by the Secretary of State and confirmed by the Senate proved to be a most unpopular measure and was upheld by the executive only with difficulty. The public showed a disposition to reject it and would not even consent to have the treaty officially interpreted by the Hague tribunal.

The quotation from Carlyle to which reference has been made runs as follows: "Hast thou considered how thought is stronger than artillery parks, and writes and unwrites acts of parliament, removes mountains, models the world like soft clay."

The spirit of the pronouncement of Carlyle has been repeated recently by Mackenzie King, and all the foolish raisers of strife in Colorado and New York and many of the legislators in the former state have declared against the treason that any man should believe that anyone could do good by power of suasion and generous support of ameliorative measures.

Only those who advocate disorder and discontent or seek to make restrictive laws are allowed to believe they can and are doing good. All the apostles of coercion by law, all the advocates of unlawful violence and all the sinister seekers for political preferment like P. J. Walsh have professed to be shocked at King's statement that "the will and conscience of John D. Rockefeller is more powerful in Colorado at present than any force that could be brought to bear to better conditions."

We are fully of Mr. King's opinion. We will add furthermore that we would make the same statement of John R. Lawson and Mother Jones as he has made of John D. Rockefeller if those two breeders of discontent were together or singly to seek, like Rockefeller, the pacification and betterment of Colorado. For men are better than legislators, and leaders are more than laws. We believe that a generous consideration of labor problems will eventually end social strife. In the end law will do but little. It is "the letter that killeth and the spirit that giveth life." And if a man of influence by reason of past association or by wealth devotes himself to the Colorado problem success is quite likely to follow.

So far from King's statement being un-American, it is animated by the best principles of our civilization. We believe that the public should not be dragooned by law, but led into the right course by suasion.

There is little virtue in enactments unless they are backed by public sentiment, and the law and order that some seek which would permit the burning of mine plants and deny to the owners the right of defense is an order which, while it may commend itself *at times* to the Colorado legislature, or parliament, is advantageous to no one, certainly not to the workmen, and it can never bring peace.

The animus against the Rockefellers is largely a manufactured sentiment. Like Robin Hood, the older Rockefeller has largely despoiled the rich by methods formerly followed by the general business world and enriched the poor by the giving of liberal wages. One of the charges against the older Rockefeller which has stuck is that he paid his men in the oil fields of Pennsylvania wages bigger than his competitors could afford and gave his men model treatment without any taint of paternalism.

One cannot understand why, to the workingman, Rockefeller has not been a popular idol. Those well-to-do who have suffered from his competition are far more willing to do him honor than the workingmen to whom he was always a ready paymaster and an unmagnetic though by no means an ungenerous friend.

He is largely the victim of the organized discontent of the coal fields, and it would seem that he must often contrast the frugal, industrious, appreciative American employees in the oil fields of Pennsylvania who pumped his wells and pipe lines with the polyglot and too often discontented people he now has to deal with on his coal-mining properties.

The Hypochondriacs

Hypochondria is a most painful depression of mind or spirits. The patient who suffers from it usually reads all the patent-medicine advertisements and sincerely believes he has all the diseases mentioned. This evil is so common that some doctors have seriously suggested that advertisements suggesting ailments and asking the question, Do you have this or that? be suppressed.

But hypochondria is not found solely with regard to bodily ills; it is unfortunately frequent in relation to matters political. The operator often has the disease with regard to his employees. He imagines that all kinds of unholy purposes animate them. Just as a true hypochondriac dwells on one symptom till he imagines he has every disease, so your operator dwells on the folly of one man, expands it and applies it to a whole class.

And hypochondria among the workingmen is also most prevalent, and the danger of it is heightened by the lurid literature current regarding the diseases of society. Sometimes the public feels that these treatises on imagined human frailty should be suppressed so that the men with weak minds may be saved from misapprehension, and then again the problem arises as to just who could decide what leads to hypochondria and what tends to health.

The disease of hypochondria is common enough, as a review of contemporary literature proves. Therefore the duty of every citizen who is sane and sound is to be always as ready to give his views as are those who are victims of hypochondriacal obsession. Unfortunately both operators and men too often make these mental wrecks their leaders and strive not to controvert their perverted visions, but actually try to believe the fallacies they teach.

But on further thought is not that statement tainted with hypochondria, for capital and labor have been frequently led by the sanest kind of leaders, such as Gary, Rockefeller, White, Lewis and Mitchell? After all, sanity is encouragingly in the majority and the great mass of men refuse to follow where hypochondriacs lead.

A Legal Decision Interesting to Coal Men

The Supreme Court decision in the National Cash Register case will prove encouraging to the mining industry. Many mine owners and operators have been prevented from engaging in coöperative measures because of the uncertainty of the construction of the Sherman antitrust laws by the courts.

Most men want to do the right thing, but what may seem perfectly right to one may appear as quite wrong to another, especially to those not familiar with the situation. The courts are the impartial judges to determine whether such coöperative actions are necessarily illegal, for if they are needful to one side they may not be injurious to the other. The decision will be welcomed especially by the coal interests that are now considering the adoption of economic coöperative measures.

Reducing Sizes of Anthracite

For a number of years past Philadelphia dealers have discussed the advisability of requesting the mining companies to reduce the number of domestic sizes of anthracite from four—namely, egg, stove, chestnut, and pea—to two. The idea of many was to mix the egg and stove sizes and call the outcome "heater" coal, and then to create a size called "range" coal from the mixture of chestnut and pea sizes. The dealers favoring the change contended that the two sizes would answer every practical use now secured by four and that the dealers would then have to provide storage room for two sizes only.

The agitation finally resulted in the presentation of a formal resolution at a meeting of the Philadelphia Coal Exchange on May 27. The proposition was argued at great length from all angles, with the result that the exchange unanimously decided against the suggestion, and furthermore, instructed the secretary to send copies of the resolution covering its action to all the producing companies, because many of them had been approached on the subject by individual dealers. A change in sizes is likely but it will not be so radical as that just described.

Sociological Department

Manager's Round-Table Talks

The officials of the Utah Fuel Co. will hold meetings monthly so as to enter into closer relationship with one another and create a better *esprit de corps.* Such gatherings will help them to interchange ideas and to collaborate in the consideration of problems of vital interest to the company.

The attendance at these meetings will not be restricted to superintendents, but the resident engineers and foremen of the various mines will be invited to attend as well as visitors from the outside who may be interested and able to give valuable suggestions.

The first meeting was held Apr. 26 at a camp where a new field of coal was being opened. The workings at this place presented some features with which most of the officials had not, as yet, had experience. The new work consisted of lining with concrete a haulage tunnel through a stratum of rock that disintegrated upon exposure to air. Part of the tunnel was lined with reinforced concrete and in part the sides and roof were coated with cement mortar, all the work being done by the pneumatic method.

Upon their arrival at the camp the members of the party donned their pit clothes and went into the mine and saw the men spraying the tunnel with cement mortar. They then went to the coal faces and inspected the results of experiments with Red H No. 5 powder. These experiments had been previously made by the resident engineer, and the miners had been instructed how to obtain the best results with the minimum number of shots and the smallest quantity of powder. These results have proved that it pays both the miner and the company to carry on scientific investigation and instruction.

After supper the party gathered in the mine office, and with the aid of cigars furnished by the company proceeded to business. Five superintendents, three engineers, including the chief, two foremen and the general superintendent were present, the latter presiding.

It will be the custom at these meetings for the general superintendent to review first the results of the preceding month's operations at the mines. The lowering of costs or the improvements in mine conditions will be noted and the efforts of successful officials praised. Poor results will not be specifically mentioned, as the desire of all the superintendents is to keep at the top of the list, and commendation for the successful and not censure for the less competent is the remedy for poor records.

As the April meeting was the first held, no particular subject was taken up for discussion, but all present were requested to state what subjects they thought were of greatest importance.

At this meeting the following subjects were proposed: Standardization of materials and methods of using same, safety first, quantity of day's work for different grades of workmen, sanitation of camps, harmony and coöperation in departments, systematizing the distribution of tools and materials in mines, recovery of material in retreating work, proper methods of drawing pillars, standard tracks and methods of laying, quality of product, correct blasting methods and education.

These twelve subjects will keep the conference busy for at least a year. In view of the fact that the Utah Fuel Co. has already taken the first step toward instituting a campaign of education for foreigners in all its camps it was decided to have "Education" for the topic of the next regular meeting. After the meeting had adjourned the rest of the evening was spent in conversation.

Saving Ten Million Dollars a Year

Statistics gathered as to the money sent abroad from Wilkes-Barre during the first six months of 1914, before the outbreak of the war, leads to the conclusion that an outflow of nearly $10,000,000 a year from the anthracite coal fields of Pennsylvania has been stopped. The amount of money sent from Wilkes-Barre through the post office, banks and ticket agencies from Jan. 1 to July 1, 1914, was approximately $350,000. That sent through the post office includes the Kingston, Parsons, Luzerne and Ashley branches, which means that a population of approximately 75,000 shipped this amount.

The counties of Carbon, Lackawanna, Luzerne, Northumberland and Schuylkill, in which 96 per cent. of the anthracite is produced, have a population of about 1,050,000 persons, so that if money was shipped proportionately from all parts of the region the amount for six months would be $4,900,000. The amounts of money sent to Europe are largest during the Christmas holidays, so that the total annual sum cannot have fallen far short of $10,000,000.

The greater part of this was formerly remitted to Russia, Austria, Germany, Italy, Greece and the Balkan States. The sums sent to the Suwalki region in Russia, recently the scene of desperate fighting, were especially heavy. The *Wall Street Journal* recently estimated the annual amount of such remittances from the United States at $250,000,000, of which $100,000,000 went through the post office and the rest through banks, immigrant bankers and steamship and ticket agencies. The remitting of this money abroad by our alien population has now practically stopped.

All the money sent abroad from the anthracite coal region is saved out of the wages of the foreign-born workers in the anthracite mines. Of recent years the amount has decreased because the miners are buying their own houses and investing their money locally. Local bankers state that the maximum remittances were made a decade ago, when laborers were more accustomed to work here for a few years and then retire to their native lands on their savings. The decline in the amount of money sent abroad is a sign that the foreigner is now taking root.

Discussion By Readers

The Mine-Car Question

Letter No. 3—Cars used in the bituminous mines are built in a great variety of styles and sizes and for widely varying gages, but they seldom have a capacity exceeding 100 cu.ft., or about 2½ tons. In the majority of mines, the capacity of the cars is much less, averaging from 1½ to 2 tons. The cars are usually built with outside wheels, and the sides of the car are flared above the wheels so as to provide an increased capacity. They are mostly built of wood, although steel is used to a limited extent in these mines.

In the accompanying sketch I have shown the styles of mine car that are best adapted for use in thin seams and seams of moderate thickness. I have assumed an average thickness of 3 ft. in the first case and 6 ft. in the latter. The cars are shown as standing on the entry track.

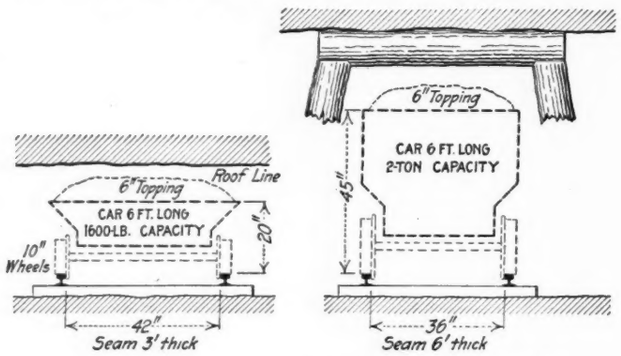


DIAGRAM OF CARS IN THIN AND THICK SEAMS

It may be assumed, however, that wood rails are used in the rooms, particularly in the thin seams. These cars, for an inside length of 6 ft., allowing 40 cu.ft. per ton and assuming a topping of 6 in. in each case, will have a capacity of 1600 lb. in the 3-ft. seam and 2 tons in the 6-ft. seam, using 10-in. wheels in the former and 16-in. wheels in the latter case.

The capacity of the car is determined by the desired output, length of haul, grade of haulage road and the kind of haulage employed, which determine the number of cars that can be hauled in a trip and the speed of hauling. Due regard must be had, also, for the size and weight of car that can be safely handled under the conditions existing in the mine. On good clean level tracks men can push cars that weigh 3000 lb. and carry a load of 2½ tons, making a total moving load of 4 tons for a loaded car. Such a load, however, is difficult to start and stop. Cars that must be moved by hand should not weigh to exceed 2 or 3 tons at the most when loaded. In this regard, however, much will depend on the condition and kind of track over which the car must be moved.

The size or diameter of the wheels greatly facilitates the movement of mine cars. Cars having 14- or 16-in. wheels are moved much more easily than cars of the same size having 10- or 12-in. wheels, other conditions being the same. Narrow track gages permit cars to be moved more easily than broad gages. In coal-mining practice the gage of haulage tracks varies from 28 to 42 in. ordinarily, depending mostly on the size of the car. The wheelbase, or distance from center to center of the car axle, rarely exceeds 42 in., and is often considerably less than this. Cars having a short wheelbase can be used on sharper curves in the track; also, when derailed, they are more easily replaced on the track.

When the capacity of the car has been determined, in accordance with the conditions mentioned, the dimensions must be made to conform with the width of the hoisting shaft, the nature of the roof and floor, and the thickness of the seam. For example, in mines where it is necessary to take the cars to the face to be loaded, the thickness of the seam practically limits the *height* of the car. Again, a bad roof or a soft, heaving bottom often necessitates the driving of narrow entries, and this limits the *width* of the car, making a certain allowance for clearance on each side of the road. The *length* of the car is generally limited by the width of the hoisting shaft. In determining this dimension, a sufficient allowance must be made for clearance in the shaft. This should vary from 6 to 10 or 12 in., according to the condition of the shaft. In the absence of specified details, an allowance of 6 in. for bumpers and end-boards should be made at each end of the car. The dimensions, length, width and thickness, are estimated from the required capacity as inside measurements.

GEORGE STOCKDALE.

Mt. Braddock, Penn.

Letter No. 4—I have noted with much interest the discussion that has recently arisen in reference to mine-car construction. My attention was first attracted by the article of R. Z. Virgin, COAL AGE, May 1, p. 752.

While I have never been a believer in large, heavy and expensive mine cars where a lighter car would answer the purpose, it must be recognized that conditions of mine haulage have greatly changed from the time when there was not the demand for coal that there is at the present day. The output of the mine was small, and mules were used to haul the cars underground. The cars for that purpose could be built light and were inexpensive.

The present great demand for coal has led to the employment of electric or compressed-air locomotives, which have largely replaced the mule on the main-haulage roads of every uptodate mine. The mine cars for this service require to be built more substantially so as to withstand the heavy bumping and jerking incident to the haulage of trips varying from 100 to 200 tons.

The question of what constitutes the best mine car should be left largely to the coal-mine operator to determine, although I freely admit that there is a wide variation of disposition on the part of many operators who often will not hestitate to spend $2000 for an electric locomotive to take the place of mules underground, believing that the electric locomotive will do the work

more economically. The same operator, however, will hesitate to replace his mine cars with cars better adapted to a heavier service because of the increased outlay required. This may be poor judgment, but is, nevertheless, the condition that must be met by the manufacturers of mine cars.

As a result of this condition, we have in our shop-files over 2000 drawings of mine cars of different patents and varying in sizes and dimensions. In our general catalog, we illustrate 25 of these designs built for track-gages varying from 36 in. to 56½ in. I may say that we have never yet, in our experience, built indentically the same car for any two companies. The reason for this is to be found largely in the fact that no two coal mines are operated under conditions exactly similar in every respect. The car that is suitable for one mine will not answer for service in another mine.

In general, it may be said that the question of daily output together with the conditions existing in the underground workings determine the required capacity and size of the mine car. Again, the height of the mine car above the rails is much dependent on the thickness of the seam and is modified, also, by the question of whether the output of the mine is for steam or domestic use. In our experience, for *domestic* coal a larger percentage of lump is loaded and, in this case, a greater clearance must be allowed above the top rail of the car. Also, the side- or end-boards must be low to permit of the loading of large lumps of coal.

Strange to say, even the method of paying the men controls, to some extent, or modifies the style of car that is desirable. For example, if the miners are paid by the car, they will load their cars only level with the top rail, and will not build them up with a "topping" of coal, as is the general practice where the miners are paid by the ton. It often happens that a coal operator is forced to pay at the same rate on the same basis as another adjoining mine and, for this reason, he is subject to a loss unless he has a car of the same size and weight as that of his neighbor.

In closing, I may say it is our experience that there are more operators using cars that are too large than too small. In our practice, we have probably cut down a hundred different cars or reduced their size on the second order, but I do not recall that we have ever filled a second order with a size *larger* than that called for in the first order. It is worthy of note, however, that where a certain wage scale governs a district, this fact will often make it absolutely necessary for operators to employ cars of light dimensions or capacity.

In considering this question, it is, of course, readily admitted that the lighter the car the more easily it is handled at the working face, and this is a big advantage as it largely affects the daily output of each miner who must load and handle his car in his own room. The question that must be determined in each case is, therefore, whether such car can be handled and loaded economically, taking all these matters into consideration. I do not believe that any absolute rule can be laid down that will determine the size and shape of a mine car for service in all seams of coal and under all conditions of haulage. Each problem must be treated independently to satisfy its own conditions.

H. W. SANFORD.

Knoxville, Tenn.

Recent Compensation Act in Pennsylvania

Letter No. 1—Since the passage of the Workman's Compensation Act by the Assembly of Pennsylvania, May 18, 1915, I have been expecting to see in COAL AGE some comment on the bill, either editorially or otherwise. This measure has been struggling for birth in the legislature for several sessions and its natal day should not pass altogether without some expression of opinion from the class of people whom it is *supposed* to affect. A discussion of its economic value as a law would be of interest.

At the expressed demand, no doubt, of a majority of her citizens, Pennsylvania has followed the example of numerous other states and passed a law that is expected to be of material benefit to the large class of industrial workers in the state. The measure was for a time successfully opposed by those who feared its effect on their interests, but harmony at last prevailed and the measure received the unanimous approval of all parties concerned.

For the protection of corporate interests affected by this law, the Pennsylvania workman's act contains the following proviso, art. III, sec. 302:

(a) In every contract of hiring made after December 31, 1915, and in every contract of hiring renewed or extended by mutual consent expressed or implied after said date, it shall be conclusively presumed that the parties have accepted the provisions of article 3 of this act and have agreed to be bound thereby, unless there be, at the time of the making, renewal or extension of such contract, an express statement in writing from either party to the other, that the provisions of article 3 of this act are not intended to apply, and unless a true copy of such written statement, accompanied by proof of service thereof upon the other party, setting forth under oath or affirmation the time, place and manner of such service, be filed with the bureau within 10 days after such service and before any accident has occurred.

Every contract of hiring, oral, written or implied from circumstances now in operation, or made or implied on or before December 31, 1915, shall be conclusively presumed to continue subject to the provisions of article 3 hereof, unless either party shall, on or before said date, in writing, have notified the other party to such contract that the provisions of article 3 hereof are not intended to apply, and unless there shall be filed with the bureau a true copy of such notice, together with proof of service, within the time and in the manner hereinabove prescribed; provided, however, that the provisions of this section shall not be so construed as to impair the obligations of any contract now in force.

In the employment of minors, article 3 shall be presumed to apply unless the said written notice be given by or to the parent or guardian of the minor. It shall not be lawful for any agent of this commonwealth, or for any county, city, borough or township therein, or for any officer or agent thereof, or for any other govermental authority created by the laws of this commonwealth, to give such notice of the rejection of the provisions of this article to any employee of the state or of such governmental agency.

It does not require a very careful study of this section to reveal the fact that, instead of the employer being compelled to become a contributing party to the liquidation of the compensation to an injured employee, as the different provisions of the act require, he is by this section legally armed with the power to annul all rights to claims against him for damages or injuries sustained.

The daily press has heralded this act as being "the most important piece of legislation that has passed the Assembly for years." If its importance measures the benefits conferred on a single class only, it may be considered as one of the most important pieces of class legislation that has ever been enacted in the State of Pennsylvania or any other state.

At the present time, an injured workman possesses the right of seeking redress through a process of common law and stands some chance of securing the granting of his claim. When the present act goes into operation, Jan. 1, 1916, the individual worker will be compelled by the law to relinquish this right, provided the act be upheld as being constitutional, as it undoubtedly will be unless this feature is successfully fought by those most interested.

Not being a lawyer, either constitutional or any other kind, I would not hazard a statement as to the part or parts of this act on which its constitutionality could be contested; but as a member of the laity, it appears to me radically wrong and a usurpation of individual rights. It seems reasonable no law can compel a man to sign away, not only his own, but the personal rights of those dependent on him, in order to secure employment and earn a livelihood.

I believe that the common law emphasizes the point that any affirmation, promise or contract made under duress is not obligatory on the part of the maker. If this be true, why should not a contract containing conditions at variance with legalized rights be regarded as void if not criminal? The former is a compliance secured through physical fear; the latter is a compliance secured through physical necessity. What is the difference between the means employed and the ends secured in either case, except that in the latter the criminality of the means will be legalized?

The right of contract should cease or be declared void when its exercise involves conditions that are inimical to the interests of either contracting party. I do not regard it as a refutation of the argument or a vindication of the act that the right of contract is an inalienable right; it undoubtedly is so when the contracting parties are untrammeled and uninfluenced by the demands of necessity, and I believe that the law assumes that a contract or agreement to be valid must be made by the voluntary action of each of the contracting parties.

By the section of the act to which I have referred, the state has placed in the hands of one class of its citizens the power to compel the acquiescence of another class to its demands.

The industrial classes of the state have "asked for bread and have been given a stone;" they have begged for an amelioration of their condition and the bands of subjection have been drawn tighter by their legislators.

The working classes of Pennsylvania are desirous of securing assistance for those of their number who may be placed in straitened circumstances through the accidents incident to their occupation. They have given their unrequited time, labor and coöperation in their efforts to advance all provisions for safeguarding life and reducing accidents, and I cannot believe that they ask for compensation for accident at the undivided expense of any one class, but they are willing to pay their proportionate share, in conjunction with their employers, for the establishment and maintenance of such a fund. Pennsylvania should be ashamed of having gained the distinction of enacting one of the most farcical pieces of legislation that has ever disgraced the statute books of the state.

A. M. INER.

——, Penn.

Labor in Mining

Letter No. 7—Reading the account given in "Extracts from a Superintendent's Diary," COAL AGE, June 5, p. 964, of a mine strike that resulted in the killing of two nonunion miners calls to mind my own personal experience in a strike at the mines of the Westmoreland Coal Co. a few years ago.

One summer evening an Italian organizer and a score of Italian strikers from Latrobe got off the train at Ligonier. Going to a barroom, they purchased several bottles of whisky and made their way up the Ligonier Valley R.R. to Wilpen, to the plant of the Marietta-Connellsville Coke Co. Here the organizer called a meeting and told the miners to quit work, promising them a weekly relief check while they were idle. He told them, however, that they must work for it and not sleep until 10 o'clock, but must fight hard those "scabs" in order to win the battle.

A big demonstration was arranged and everyone was notified to be at a certain point at 3 o'clock the next morning, when they would march to Waterford, a distance of about two miles. They were to be armed with revolvers and to compel the men working at the Fort Palmer Coal & Coke Co.'s plant to stop work.

They met at the time and place appointed and had gone about half a mile when they overtook two miners riding in a buggy, who were ordered to turn and join the ranks. Upon their refusal to do this, some shooting occurred, one of the strikers grabbing the horse by the bridle while others fired at the men sitting in the buggy. Word soon reached the state troopers stationed at Ligonier, and four of them immediately started to the scene. The miners, on reaching the crest of the hill, saw the troopers galloping along Waterford Pike. Believing that the officers would search them for guns, they all with a few exceptions gave their weapons to two of their number who were hurriedly chosen to carry them away. There were 106 revolvers of various calibers. The two men, with some difficulty, carried these instruments to Frank Bolha's store, where they hid them. This only prevented the riotous and murderous acts that would have followed had the men kept their weapons.

I was also much interested in Letter No. 4 by Karl F. Schoew, June 12, p. 1034. I believe, as he states, there will be a great change in industrial conditions, especially in coal mining. At the present time, everything seems to be at a standstill. There is nothing doing, and many of the miners having large families to support and being obliged to rent their houses face a hard proposition. In some cases they have exhausted their credit at the company's store, and necessity compels them to go elsewhere for work.

In dealing with the strike question, reference has been made to "trouble makers." Much might be added to what already has been said, but it is clear in my mind that coal companies should take every precaution to adopt a system similar to that which is employed in England, where more consideration is given to the miners' actual necessities, and men of large families are assisted in every possible way when times are slack, which establishes a better feeling between the mine officials and the miners generally, and greater harmony prevails.

In closing, I will say that there is probably in every mining camp one or more so-called "leaders." These men

no doubt know more than the rank and file of the miners whom they control. They keep posted on market conditions and understand the difficulties and experiences of the company. These leaders, however, are not satisfied unless they are treated a little better than their brother miners. Failing in this, they make every effort to influence the whole camp and arouse the men to make a demand for increase in wages or better conditions in the mines. Unless coal operators are alert to this condition, trouble is sure to follow; but this can often be avoided by suitable tact and prompt action. I heartily endorse the idea of a school for miners where they can learn the English language and become acquainted with coal-trade conditions so that they will better understand when it is necessary for the operator to reduce wages in order to keep the mine in operation.

MINE FOREMAN.

——, Penn.

Preventing Mine Explosions

Letter 2—Referring to Mr. Riley's letter on this subject, COAL AGE, May 29, p. 938, I believe he has omitted to mention a few precautions that are as important in this connection as those to which he has drawn attention.

I would suggest the following as worthy of careful consideration: 1. The use of permissible explosives wherever these can be employed with satisfaction and advantage. 2. The prohibition of the use of dynamite for blasting coal in mines. 3. The prohibition of the practice common with many miners of mixing different kinds of explosives in the same hole. 4. The use of clay or other incombustible material for tamping.

I fully agree with Mr. Riley in the suggestion that all accumulations of fine coal and dust should be prevented, and, as far as practicable, this should be loaded out in dustproof cars. It is impossible, however, to remove and load out all the fine dust that accumulates on the timbers and waste places in the mine, nor is it possible to load out all the fine coal and dust that accumulates on the haulage roads. For this reason, it is important that the roadways and timbers should be thoroughly sprinkled so as to keep the roads continually in a moist condition. This can be accomplished by a suitable spraying system, by the use of water or steam, or by frequently washing down the timbers, gobs and ribs in all passageways. The spraying system is preferable if the roof conditions existing in the mine will permit of its use.

EDW. H. COXE.

Knoxville. Tenn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Atomic Heat—An important relation has been found to exist between the atomic weights of the elements and their specific heats. Dulong and Petit (1819) found that the specific heats (relative heat capacity) of most of the solid elements vary inversely as their atomic weights, so that the product of these two factors is a constant quantity (6.4), which has been properly called the **"atomic heat."** Thus, taking the specific heats of iron, lead and mercury, respectively, as 0.1190, 0.0305 and 0.0333, gives the value for the atomic heat in each case as follows:

	At.Wt.		Sp.Ht.		At.Ht.
Iron,	55.40	×	0.1190	=	6.59 heat units.
Lead,	205.44	×	0.0305	=	6.27 heat units.
Mercury,	198.40	×	0.0333	=	6.61 heat units.

The average value for the atomic heat of the elements may be taken as 6.4, though it is sometimes given as low as 6.25 (Remsen). **Atomic heat** may be briefly defined as the heat capacity of matter per unit-weight atom.

A **gram-atom** of any elementary substance is a weight of that substance, in grams, equal to the atomic weight of the element. Thus, the atomic weight of iron being 55.4 (H = 1), a gram-atom of iron is 55.4 grams of that substance; and its heat capacity is the atomic heat value (6.4 heat units).

This average value of **atomic heat** often assists the determination of the specific heat from the atomic weight of an elementary substance, or, vice versa, its atomic weight when the specific heat is known. For example, since the heat capacity of 55.4 grm. of iron is 6.4 heat units, the average specific heat of iron is 6.4 ÷ 55.4 = 0.1155.

In like manner, a **gram-molecule** of any compound substance is a weight of that substance, in grams, equal to the molecular weight of the substance.

Calculation of Density—The elements form the basis of all relative measurements with respect to volume, density and weight. For example, the density of air, referred to hydrogen as unity (H = 1), can be calculated from the relative weights and volumes of oxygen and nitrogen, which are the chief constituents of air. The composition of pure air, by volume, is practically, oxygen (O) 20.9 per cent., nitrogen (N), 79.1 per cent. Then, since the atomic weight of oxygen is 16 and that of nitrogen 14, the relative weight of 100 volumes of air, referred to hydrogen as unity, is found as follows:

Oxygen,	20.9 × 16	= 334.4
Nitrogen,	79.1 × 14	= 1107.4
Air,	100 vol's	= 1441.8

Therefore, one volume of air is 1441.8 ÷ 100 = 14.418 times as heavy as the same volume of hydrogen; or, the density of air referred to hydrogen is 14.418.

The percentage composition of pure air, by weight, is readily calculated from the above figures; thus:

$$\text{Oxygen,} \quad \frac{334.4 \times 100}{1441.8} = \text{say 23.2 per cent.}$$

$$\text{Nitrogen,} \quad \frac{1107.4 \times 100}{1441.8} = \text{say 76.8 per cent.}$$

The Coal Age Pocket Book

Transmission of Heat—The condition known as "heat" is transmitted in any one of the three following ways: 1. By **radiation.** 2. By **conduction.** 3. By **convection.**

Heat is radiated in straight lines in all directions from its source and is then called "radiant heat." It is transmitted through the vibrations of the ether that fills all space and the radiated heat is imparted in varying degree to all matter in its path. Heat so imparted to a body is said to be "absorbed" by the body.

When heat travels through a body the process of transmission is known as "conduction." Heat thus spreads throughout the **mass of a solid.**

The spread of heat **in any fluid** (liquid or gas) is through the circulation caused by the unequal distribution of the heat. This mode of transmission is known as "convection."

Measurement of Heat—Although heat, as already explained, is a **condition of matter** and not a tangible quantity, it is possible to measure its intensity or degree through the effect it produces, referred to certain established **standards of measurement.** The most convenient standard is the heat energy that will cause a rise of one degree in the temperature of a unit weight of pure distilled water at its point of maximum density. This is called a "heat unit" or "thermal unit" and is a quantity capable of exact measurement.

Heat or Thermal Units—There are several heat units in common use, the principal ones being the British unit and the French unit. A third unit that is largely used combines these two units.

The British Thermal Unit—The British thermal unit (B.t.u.) is the quantity of heat required to raise the temperature of 1 lb. of pure distilled water at maximum density, 1 deg. of the Fahrenheit scale.

The French Thermal Unit or Calorie—This is the quantity of heat required to raise the temperature of 1 kg. of pure distilled water at maximum density, 1 deg. of the Centigrade scale.

The Pound Calorie—This is the quantity of heat required to raise the temperature of 1 lb. of pure distilled water, at maximum density, 1 deg. of the Centigrade scale.

Conversion Formulas—

B.t.u.	×	0.252	=	Calories
B.t.u.	×	5/9	=	Pound-calories
Calories	×	3.968	=	B.t.u.
Calories	×	2.2046	=	Pound-calories
Pound-calories	×	9/5	=	B.t.u.
Pound-calories	×	0.4536	=	Calories

Note—Since 1 lb. (avoirdupois) = 0.4536 kg.; and 1 deg. (Fahr.) = 5/9 deg. (Cent.),
1 B.t.u. = 0.4536 × 5/9 = 0.252 cal.
Again, since 1 kilogram = 2.2046 lb. (avoir.); and 1 deg. (Cent.) = 9/5 deg. (Fahr.),
1 cal. = 2.2046 × 9/5 = 3.968 B.t.u.

These simple calculations show the derivation of the constants used in the above formulas.

Inquiries of General Interest

Rail vs. Water Freights to the Pacific Coast

Some time in the near future the coal operators in the Middle West will have a chance to suggest to the railroads the advisability of their making a reduction in freight rates from Wyoming and Utah points to the Pacific Coast, so as to enable the coal here to compete with shipments of coal on the Atlantic Coast now passing through the canal and destined for Pacific Coast points.

From this inland locality it is very hard to obtain authentic information in regard to the shipping of coal by water, and it has occurred to me that COAL AGE might furnish the coal operators in this section with some general information in regard to the cost of shipping coal through the canal that would be of value in the solution of this problem. Any information you can give that will assist us in obtaining an equable adjustment of this important matter will be greatly appreciated.

H. C. MARCHANT,
Sales Manager, Lion Coal Co.

Ogden, Utah.

[Since the opening of the canal the problem presented in the above inquiry has been of growing importance to shippers throughout the Central Basin and Rocky Mountain Districts. The next issue of COAL AGE will contain Letter No. 1, discussing the important features involved. Let others follow.—EDITOR.]

Coal Seams in Indiana

Can you inform me how many workable coal seams there are in the State of Indiana, giving the names of the different seams?

J. MCMILLAN.

Clinton, Ind.

The workable seams of coal in Indiana vary, in the different counties of the state, from 2 to 18 in number and from 2 ft. 8 in. to 10 ft. 2 in. in thickness. A chart of the Indiana coalfield, prepared by Edwin F. Lines, shows a vertical section through the coal measures. The various coal beds or seams in this section are numbered from the bottom upward as Coal 1, 2, 3, 3a, 4, 4a, 5, 5a, 6, 7 and 8. These practically include all the workable seams in the state. The two lowermost of these divisions, however, are subdivided and described as Cannelton, Lower Block, Upper Block and Minshall coal. The uppermost division of the measures (Coal 8) is not workable.

To summarize these remarks, it may be stated that there are practically nine workable seams in the state; namely, counting from the bottom of the measures, the Cannelton, Lower Block, Upper Block, Minshall and seams 3, 4, 5, 6 and 7 previously mentioned. The celebrated block coal of Indiana predominates in Clay County; the Minshall coal is worked principally in Clay, Daviess, Parke and Fountain Counties. The Upper and Lower Block seams vary from 3½ to 4½ ft. in thickness, while the Cannelton coal has an average thickness of 3 ft. and the Minshall coal varies from 3 ft. to 5 ft. 6 in.

The table gives some interesting data in regard to Indiana coal seams and their estimated tonnage:

TABLE SHOWING THICKNESS AND EXTENT OF COAL SEAMS AND DISTRIBUTION BY COUNTIES

County	Number of Seams	Maximum Thickness of Single Seams		Maximum Total Thickness of Seams		Maximum Total Thickness Workable		Total Coal Area	Workable Coal Area	Estimated Total Tonnage of Coal	Estimated Tonnage Removed or Unworkable	Estimated Tonnage Available
		Ft.	In.	Ft.	In.	Ft.	In.	Sq. Mi.	Sq. Mi.	Million Tons	Million Tons	Million Tons
Clay	16	9	0	27	0	19	0	250	100	1200	70	300
Crawford	3	4	0	4	0	2	6	12	..	10	0.15	0.4
Daviess	15	7	3	27	0	19	0	400	200	2500	7	400
Dubois	9	5	0	17	0	12	0	300	40	1000	0.1	50
Fountain	7	8	0	15	0	9	0	325	75	500	3	150
Gibson	15	7	7	20	0	13	0	450	400	6000	2	1000
Greene	14	7	0	45	0	35	0	300	200	1000	40	400
Knox	15	9	10	36	0	23	0	540	300	8000	3000	2000
Martin	7	4	0	12	0	7	0	175	14	500	0.5	20
Orange	2	2	8	4	0	2	6	1	..	1	..	0.2
Owen	4	6	1	10	0	8	0	125	30	67	0.7	15
Parke	11	7	6	35	0	24	0	470	100	1000	30	435
Perry	7	5	8	8	0	3	0	30	6	36	3.5	9
Pike	13	10	2	20	0	13	0	330	200	2000	20	650
Posey	11	6	0	25	0	17	0	420	200	2000	..	500
Putnam	2	3	0	5	0	5	0	100	1	50	0.4	2
Spencer	11	5	10	20	0	13	0	300	24	1000	0.3	50
Sullivan	18	9	0	40	..	28	0	440	365	10,000	50	4000
Vanderburgh	10	4	6	18	0	12	0	240	200	2000	25	1000
Vermillion	12	7	0	35	0	22	0	250	200	1500	30	600
Vigo	18	7	6	43	0	33	0	400	300	4000	50	1500
Warren	4	4	2	9	0	7	0	300	30	500	0.6	50
Warrick	12	9	0	25	0	19	0	356	175	2000	10	500

The seams attaining a thickness of 6 ft. and over in the state are as follows: Seam, 3, having a thickness of 7 ft. 6 in. in Greene, 7 ft. 4 in. in Vigo, 7 ft. in Clay and 6 ft. 6 in. in Sullivan Counties; seam 5, having a thickness of 8 ft. in Clay, 7 ft. in Pike, Knox and Warrick Counties, 6 ft. 10 in. in Sullivan and Gibson Counties and 6 ft. in Greene and Daviess Counties; seam 6, having a thickness of 6 ft. 6 in. in Sullivan; and seam 7, having a thickness of 6 ft. in Vigo County.

Sampling Coke

What are the important points in the sampling of a consignment of coke for the purpose of determining its fuel value for power purposes, and how does the sampling of coke differ from that of coal?

FUEL INSPECTOR.

Chicago, Ill.

The quality of coke is much more uniform than that of coal, owing to the process of crushing and mixing the coal before coking. A smaller sample of coke is therefore required. The appearance of the coke, unlike coal, furnishes no index of its quality in respect to the percentage of ash, sulphur or phosphorus, which must be determined in the laboratory. The bright silvery luster and the dark discoloration are alike the results of the burning. It is well, however, to select as samples the long slim pieces as better representing the oven charge from top to bottom.

Examination Questions

Montana Mine Foremen's and Firebosses' Examination Held at Red Lodge June 8-10, 1915

(*Selected Questions*)

Ques.—If 13 cu.ft. of air, at ordinary temperature and pressure, weighs 1 lb., how many tons of air are passing through a mine in 8 hr., where the current measures 52,000 cu.ft. per min.?

Ans.—Assuming that the temperature and pressure in the mine are the "ordinary temperature and pressure" mentioned in the question and that the mine air weighs 1 lb. for each 13 cu.ft., the weight of air passing through the mine in 8 hr. is

$$\frac{52{,}000}{13} \times \frac{1}{2000} \times 8 \times 60 = 960 \textit{ tons}$$

Ques.—Where are gases found in mines, and how are they produced?

Ans.—The common mine gases occur in largest quantity, in a properly ventilated mine, at or near the points where they are generated; but in a poorly ventilated mine these gases may accumulate in considerable quantities in void or abandoned places where they have found their way, or at the face of rise or dip workings where they accumulate by virtue of their densities. Those gases *lighter* than air find their way naturally to the rise workings and cavities in the roof or above the falls, while those *heavier* than air gradually sink to the floor and other low places in the mine, such as swamps and dip workings. The hydrocarbon gases, as methane, olefiant gas to some extent, and ethane, which is frequently associated with methane, are confined in the natural strata known as the "coal formations" and issue from the strata into the mine workings.

Carbon dioxide is produced in the complete combustion of coal and other carbonaceous matter in the mine. These forms of combustion are continually occurring in the breathing of men and animals, burning of lamps and the slow combustion of fine coal and slack in the waste places of the mine.

Carbon monoxide is produced largely by the explosion of powder and the combustion of carbonaceous matter in a limited supply of air.

Sulphureted hydrogen, when found in mines, is usually the result of the action of water on pyrites (FeS_2) so often associated with the coal.

Ques.—How are gases caused to expand out of the strata and at times to overflow the workings of a mine?

Ans.—The gases occluded in the coal formations exist there under more or less pressure. It may not be thoroughly understood what actual causes produce the outflow of these gases from the strata. Undoubtedly, the pressure under which the gases are occluded plays an important part in their emission. It is probable, also, that the diffusive action known as "osmose" by which gases pass into each other through a porous medium, plays an important part in the escape of the occluded gas through the pores of the coal.

What is known as an "outburst" of gas from the strata is the result of the accumulation of occluded gas in crevices and other void places in the strata, under great pressure. This pressure is thus distributed over a considerable area and is often sufficiently great to break down the coal at the face of the workings or to heave the floor of the mine or cause a heavy fall or roof, according as the gas is confined in the underlying or overlying strata of the seam. At other times, such accumulations of gas in the strata find their way into the workings through a crevice or drillhole, and this is known as a "feeder" of gas or "gas feeder."

Ques.—What is firedamp?

Ans.—The term "firedamp," in this country, is applied to any inflammable or explosive mixture of methane and air, with or without other gases. A simple mixture of methane and air, in proportions that are not inflammable or explosive, cannot properly be termed firedamp, although the term is often taken to mean *any* mixture of methane and air.

Ques.—What percentage of firedamp is most dangerous?

Ans.—When the proportion of air to gas is such that the mixture is above the maximum explosive point, the danger is greater than when the proportion of gas is less than what marks this point. The reason is that when a larger proportion of gas is present any addition of air, which is liable to occur in the mine at any time, will render the firedamp mixture more explosive. In other words, the addition of fresh air to a firedamp mixture *above* the maximum explosive point will increase the explosiveness of the mixture until that point is reached, after which the further addition of air will decrease its explosive condition.

Ques.—What effect would carbon dioxide (CO_2) have on marsh gas (CH_4) when these are mixed together?

Ans.—The mixture of carbon dioxide with marsh gas will have no effect on the gas itself; but when carbon dioxide is added to a mixture of marsh gas and air (firedamp) the effect is to reduce the explosive condition of the mixture. It is estimated that when a firedamp mixture is at its most explosive point, the addition of one-seventh of its volume of carbon dioxide will render the firedamp inexplosive.

Ques.—A current of 3000 cu.ft. of air and gas is at the explosive point. How much fresh air must be added to prevent a cap?

Ans.—Assuming the question refers to the *maximum explosive point,* the quantity of gas in this current is 3000x0.0946 = 283.8 cu.ft. per min. Now, assuming a flame cap first appears when 2 per cent. of gas is present, the total circulation is 283.8 ÷ 0.02 = 14,190 cu.ft. per min. The required addition of air is then 14,190 — 3000 = 11,190 cu.ft. per min.

Coal and Coke News

Washington, D. C.

The text of the decision of the Supreme Court of the United States in the so-called Commodity Clause case affecting the Delaware, Lackawanna & Western R.R. and its affiliated coal concern, has been made available within the past few days and apparently brings one phase of the litigation in question to a definite conclusion. (No. 517, October term, 1914; U. S. appellant vs. D., L. & W. Ry. Co., and D., L. & W. Coal Co.) The case is moreover of special interest because of the conflicting decisions that have heretofore been rendered with reference to the working of the so-called Commodity Clause in the Interstate Commerce Act, under which it was made unlawful for a railroad company to carry on any business not connected with transportation, and thus makes a detailed review of the case worth while at this time.

The act of 1906 made it unlawful for carriers to haul their own coal beyond the limits of the state in which they were located; and, desiring to continue the business of mining and transporting coal, the Delaware, Lackawanna & Western R.R. Co. adopted a plan under which it was to make a sale and divest itself of title to the coal, at the mouth of the mines, before transportation began.

Accordingly it caused to be incorporated, under the laws of New Jersey, the Delaware, Lackawanna & Western Coal Co. with a capital stock of $6,800,000,—divided into shares of $50 each. The railroad company then invited its own stockholders to subscribe to the capital stock of the coal company at the rate of one share of the latter for each four shares of the former. Ninety-nine per cent. of these stockholders did, as was expected, subscribe for the stock of the coal company—their subscriptions being paid for in full out of a cash dividend of $13,600,000 previously declared by the railroad company.

The new corporation was then organized by electing the vice-president of the railroad company as president of the coal company, while other officers and directors of the coal company were also officers and directors of the railroad company.

As soon as the organization was completed, the railroad company prepared and submitted to the coal company a contract by which the railroad company, reserving what it needed for its railway locomotives, "agreed to sell and the coal company agreed to buy, f.o.b. the mines, all coal which, during the term of the contract, the railroad company should produce from its own mines or purchase from any one else." The price for prepared sizes—the more important commercial coal—was fixed at 65 per cent. of the price in New York on the day of delivery at the mines. The railroad company also leased to the coal company all its trestles, docks and shipping facilities.

Both Companies Signed Contract

The contract—thus prepared by the railroad company—was then signed by both corporations and, on Aug. 2, 1909, the coal company took possession of the leased property; those who had been agents of the railroad in its sales department became agents of the coal company in its sales department, and the two corporations, with managing officers in common, also had offices in common in the City of New York.

Thereafter the railroad company continued its mining business, annually producing about 7,000,000 tons and purchasing about 1,500,000 tons from operators whose mines were located on its railway. After retaining what was needed for use on its railway engines, it sold the balance, aggregating about 7,000,000 tons, to the coal company at the contract prices, f.o.b. the mines. The coal thus sold by the railroad company was then transported by it to destination where it was delivered to the coal company which paid the regular tariff freight rate and the contract price on the 20th of each month. This course of dealing continued until February, 1913, when the Government filed a petition, against both corporations, alleging that the two were practically one, and attacking the validity of the contract.

This particular case was appealed from the District Court of the United States for the District of New Jersey, where the decision has gone against the contention of the United States that such an arrangement as has thus been set forth was out of harmony with the provisions of the law. The decision of the court was based upon the view that the essential object of the commodity clause was to prevent railroads from occupying the dual and inconsistent position of public carriers and private shippers, and that it must be broadly interpreted in its application to the operations of the company with a view to finding out whether given practices are or are not inconsistent with the attainment of such an object.

Without going into the technical legal analysis of the various aspects of the contract between the railroad company and the coal company, it is worth while to note the position taken by the two companies in general terms.

The Contract Carried Unusual Provisions

The most cursory examination of the contract shows that—while it provides for the sale of coal before transportation begins—it is coupled with onerous and unusual provisions which make it difficult to determine the exact legal character of the agreement. If it amounted to a sales agency the transportation was illegal because the railroad company could not haul coal which it was to sell in its own name or through an agent. If the contract was in restraint of trade it was void because in violation of the Sherman Anti-Trust Law. The validity of the contract cannot be determined by consideration of the single fact that it did provide for a sale. It must be considered as a whole and in the light of the fact that the sale at the mine was but one link in the business of a railroad engaged in buying, mining, selling and transporting coal.

The court further finds that the provision in the contract whereby the railroad was able to dictate to whom the coal should be sold even at unprofitable prices, was also objectionable from the standpoint of the law, while various other elements contained in it practically made it an instrument of monopoly. The contract, therefore, violated not only the commodity clause of the Interstate Commerce Act, but also the Sherman Anti-Trust Law in the consequent conclusion.

Particularly in its application to the railroad business, the decision makes clear that such a company if it continues in the business of mining, must absolutely dissociate itself from the coal before the transportation begins. It cannot retain the title nor can it sell through an agent. It cannot call that agent a buyer while so hampering and restricting such alleged buyer as to make him a puppet subject to the control of the railroad company.

If the railroad sells coal at the mouth of the mines to one buyer or to many, it must not only part with all interest direct or indirect in the property, but also with all control over it or over those to whom the coal is sold at the mines. It must leave the buyer as free as any other buyer who pays for what he has bought.

It should not sell to a corporation with officers and offices in common—for the policy of the statute requires that instead of being managed by the same officers, they should studiously and in good faith avoid anything, either in contract or conduct, that remotely savors of joint action, joint interest or the dominance of one company by the other. If the seller wishes—by a lawful and bona fide contract, whose provisions as to delivery and otherwise are not in restraint of trade—to sell all of its coal to one buying company, then that one buyer can be bound by reasonable terms and required to pay according to the contract.

PENNSYLVANIA

Anthracite

Pottsville—Evidently the officials of the United Mine Workers of America are beginning a campaign to instill enthusiasm in the miners of the anthracite region in anticipation of the new agreement which it is expected will be entered into at the expiration of the present arrangement on Mar. 31, 1916. Announcement has just been made that John P White, president, will visit the Panther Creek Valley during July and deliver addresses in various mining towns and communities.

Shenandoah—William Singmaster, aged 34 years, was killed, and Michael Heiser, Edward Ressinger and Charles Slaterbach, so seriously burned that their recovery is doubtful, by a gas explosion in the Potts Colliery. The material damage

to the mine was also considerable, as the force of the explosion was great, tearing out the mine props and roof supports.

Wilkes-Barre—The Anthracite Conciliation Board has been taking testimony here on an appeal made by the United Mine Workers employed at Hazleton in the operations of the Lehigh Valley Coal Co. and Cox Brothers. The miners state that union pumpmen and firemen have been suspended due to short working time and their places taken by monthly salaried employees, such as bosses, foremen and clerks. Decision has been reserved.

Bituminous

Waynesburg—There will be offered for sale in front of the Greene County courthouse on Saturday, July 15, at an administratrix' sale, 186.17 acres of land, together with all mining privileges without restrictions as to the support of the surface. The land is located in Franklin Township, Greene County, Pennsylvania.

Uniontown—Orders to fire 770 more ovens of the H. C. Frick Coke Co. have been issued. The plants affected are: Wynn, 170, after a year's idleness; Bridgeport, 100, idle for about 8 months; Lemont No. 1, 160, idle for almost a year; Brinkerton, Buffington, Colonial No. 1, Continental No. 1, Edenborn, Hecla, Lambert, Leisenring Nos. 1, 2 and 3, Leith, Redstone, York Run, Youngstown, Hostetter, Whitney and Trotter. The latest order places Continental No. 1 and Leith on a capacity basis.

Marianna—Resident Manager Harris Booker of the Marianna mine of the Pittsburgh Buffalo Coal Co. has issued a call for hands to resume operations in this mine. Between 200 and 300 men will be employed. The mine reopened June 21 and prospects are bright for steady work. Good houses are located at the mine and these will all be rented to the men that secure work.

Johnstown—An abandoned mine probably more than 100 years old, in which timbers covered with water are becoming petrified, has been discovered, it is said, by Thomas Leahey, a well-known coal operator, in opening a small private mine on his property at Cassandra. The oldest residents of this section cannot recall such a mine and it is believed that it was opened before the days of the Old Portage. The heading is said to extend about 500 ft. The surface of the coal indicates that picks were used and that no dynamite or powder was employed. Heavy square timbers were used such as are now employed for lagging a drift. The timber, because of the fact that the mouth of the mine has been closed up and the air shut off, has become so hard that it turns the edge of an axe. Inside the mine was a small mine car that would hold about four bushels of coal. The car is of wood and has wooden wheels. The tires were made of strap iron nailed to the wheels. There were no tracks but heavy planks were doubtless used to guide the car which was probably pushed by hand.

Simpson Station—The Union-Connellsville Coke Co. has fired 100 ovens at its Katherine works at Simpson Station, about three miles above Brownsville, on the Monongahela railroad. The plant has been idle since Jan. 14, 1914. Within the next month the company expects to have the entire plant fired in full, with the expectation of steady work for a long time. It has secured a big contract.

Connellsville—Shipments of coke from the Connellsville region recently rose to 351,000 tons per week, with production at 348,000 tons, thus establishing a new high record for the year. Compared with the previous week this showed an increase in shipments of 19,000 tons. More ovens are constantly being put in service throughout the Connellsville region.

VIRGINIA

Raven—The Raven Red Ash Coal Co., located at Raven, on the Clinch Valley branch of the Norfolk & Western R.R., is installing a coal washer to wash its slack. This firm is mining the Lower Banner seam of coal, which carries a soft fire clay or draw slate above it. This comes down and breaks up, mixing with the coal, making it necessary to wash the slack in order to clean this product.

WEST VIRGINIA

Dubree—The Rothwell Coal Co. is opening a new mine on the north side of the creek about half a mile from the old one. A bed of coal over 4 ft. in thickness has been opened and there is every prospect that the operation will be a profitable one. Fifteen hundred feet of railroad is being built to the new mine.

Ethel—Six hundred miners are working in the operations of the Logan Mining Co. and the Ethel Coal Co. at the present time, which is a larger force than has been at work for more than a year. It is believed that the present boom is the beginning of a revival which will be of considerable extent. During the past year only about 200 miners have been employed at Ethel, and these in many instances were working only part time.

Williamson—On Saturday, July 10, at 10 o'clock a.m., at the front door of the Mingo County Court House, the plant and equipment of the Mingo Washed Coal Co., consisting of a lease for coal-mining purposes containing 588⅛ acres, situated at Ajax Siding in Hardee District, Mingo County, with 13 miners' houses, one bungalow, a clubhouse, store and office building, also powder house, washer, tipple and a considerable amount of machinery, such as engines, generator, switchboard, boilers, pumps, a coal washer with machinery installed, coal-cutting machines, etc., will be offered for sale at public auction. Full information may be secured on request from M. T. Persinger, trustee of the estate of the Mingo Washed Coal Co.

KENTUCKY

Hazard—The Harvey Coal Co. headquarters, Knoxville, Tenn., announces that it will be ready to begin shipping coal from the First Creek territory within the next 30 days. Already mining work is well under way.

Jenkins—The Consolidation Coal Co. announces increases in its Jenkins-McRoberts plants, owing to recent big orders aggregating several hundred thousand tons. The Elk Horn Mining Corporation in the Fleming field also has some good orders. Several hundred additional miners have gone to work in both plants.

Central City—Additional resolutions, condemning violence, which has been more or less prevalent in Ohio County, were adopted by farmers and miners assembled at a mass meeting near Williams' mines in Ohio County recently. Robert Pollock, president of District No. 23, United Mine Workers of America, presided, stating that the object of the meeting was to demonstrate to the public that the union men were against lawlessness. He read a resolution which had been prepared condenmning the outrages and pledging the miners and farmers to law and order.

OHIO

Stewartsville—The Franklin Coal Co. mine recently resumed operation with a small force of men. It will be several weeks before the company has all its employees busy, but when running full time this mine employs 200 men.

Shadyside—James and Patrick Cook, of Fairmont, W. Va., are making repairs to the Wegee mine, south of Shadyside. This mine has not been operated for three years and is in a bad condition. The old tipple and some of the other buildings have been taken down, and it will probably take some months to rebuild the plant and clean up the mine.

Warsaw—The Ohio Cannel Coal Co. has opened its mines near Warsaw after an idleness of more than two months.

Columbus—So far no legal action has been taken against the Piney Fork Coal Co. of Columbus, which is preparing to open a stripping operation in Jefferson County, Ohio. A newspaper in Steubenville is aroused over the project and is urging the county officials to stop the work by means of an injunction. It is apparently working for the miners' organization. J. W. Blower, of the company, does not anticipate any trouble. He is working to get things in shape for the delivery of the huge steam shovel some time in July.

INDIANA

Boonville—The Center Mining and Coöperative Association recently organized by the Hackett Mining Co., has started operation of the Hackett mines, with 50 operatives. The directors of the corporation are Robert Madden, Fred Geyer, Charles Wilder, Roscoe Scott and Bert Pursinger.

Evansville—The Supeiror Court here declined to appoint a receiver for the Vanderburg County Mining Co., as petitioned.

Princeton—A strike of 300 miners at the Princeton mine ended when the company returned to the old method of loading the men into the cage. The company had tried the chute plan, which, it asserted, was safer, but the employees held that it was more dangerous and in addition, contrary to law.

Kokomo—William F. Smith, representing the Inland Coal Co., has purchased the Domestic Block Coal Co.'s mines near Brazil, Ind., from the receiver, for $5000, the creditors' claims being $10,000.

ILLINOIS

New Baden—Engineers of the Southern Coal and Mining Co., in drilling for water, with the hope also of striking oil, at the Little Oak Mine, west of here, found three veins of good

coal, one at a depth of 115 ft., the second at a depth of 210 ft. and the third at a depth of 314 ft. The upper vein was 6 ft. in thickness. The two lower beds were only 3 ft. in thickness but the coal was of excellent quality. This is the first time that three coal measures have been found in this section. No oil was struck, although a well was bored to the depth of 746 ft. The primary purpose of obtaining a good supply of water was accomplished.

Belleville—A case of great importance to coal operators, originating here, has just been decided by the United States Supreme Court, which declares it is the duty of a railroad to supply cars when ordered by an operator for the transportation of coal and holds the railroad company liable for damages incurred by the operator through the failure of the railroad company to provide cars. The suit was brought in the St. Clair County Court at Belleville by the Mulberry Coal Co., of Freeburg, against the Illinois Central R.R. Co. to recover damages for the failure of the railroad to furnish cars to the company's mine, located near the road, pursuant to the demands of the mining company. It was based on the failure of the railroad company to furnish cars to the mine on certain days in 1907. A jury in the Circuit Court gave a verdict in favor of the mining company for $716.92. The railroad carried the case to the Illinois Supreme Court, which affirmed the decision of the Circuit Court, and then to the United States Supreme Court, which has now also decided in favor of the mining company. The decision by the highest court of the land that railroads must furnish cars when asked or pay damages is regarded by mining men as one of the greatest victories ever gained. Attorney A. B. Ogle, of Belleville, who with attorneys William Winkelmann and James O. Miller, presented the mining company's side of the case to the Supreme Court, says nation-wide interest has been manifested in the outcome. He has had inquiries concerning the case from Pennsylvania, Kentucky and other mining states.

Pana—Because the mine of the Pana Coal Co., one of the oldest and largest in the state, constructed at an original cost of more than $200,000, brought only $30,000 at a master's foreclosure sale recently, which was insufficient to pay the fees and certificates of the receivers, Judge McBride, in the Circuit Court, set aside the sale and ordered a readvertising and sale of the property.

PERSONALS

Edward Page was recently elected vice-president of the New England Coal & Coke Co. at a meeting of the directors.

John K. Oliphant, president of the Oliphant-Wasson Coal Co., recently purchased the old site of the First National Bank in Vincennes, Ind., where he will erect an eight-story office building.

David A. Thomas, the Welsh coal magnate, was recently appointed by David Lloyd George minister of munitions, to go to the United States to supervise the making of munition contracts in this country and Canada.

W. H. Glasgow, for many years assistant to the general superintendent of the H. C. Frick Coke Co., has been appointed assistant general superintendent. This position was held for some years by Clay F. Lynch prior to his taking charge of the Bunsen Coal Co.'s operations seven years ago.

J. H. Wood, who has been western sales manager of the Davis Colliery Co., with headquarters in Columbus for the past two years will leave July 1 to be succeeded by Maury Robinson, formerly in charge of the local office. Mr. Robinson is the son of Neil Robinson, a well-known coal man of West Virginia.

J. L. Rogers, general manager of the Lamb Coal Co. for the West Virginia capitalists who recently purchased the property, will assume the duties of the office when he relinquishes management of the Muhlenberg County Savings Bank to the First National Bank which has absorbed it. J. C. Saunders, of Premier, W. Va., is president of the new company.

Col. Richard Coulter was recently elected president of the Keystone Coal & Coke Co. to succeed the late Col. L. B. Huff. Colonel Coulter has been connected with the company as vice-president for several years. Julian B. Huff, of Greensburg, and Robert K. Cassatt, of Philadelphia, were elected vice-presidents of the company at the same meeting of the directors.

Rodman Wanamaker, who has for many years been actively associated with the mercantile interests of his father, John Wanamaker, has been elected to the board of the Lehigh Coal & Navigation Co. In addition to his activities as a merchant he is closely connected in financial circles, being at this time vice-president and a director in the West End Trust Co. and a director in the First Penny Savings Bank, of which John Wanamaker is president.

T. J. Mitchell, general manager of the Allegheny Coke Co. on returning to his home in Uniontown, Penn., announced that this firm's plant in Pike County, Kentucky, would resume operations on July 1 after an idleness of six months. One hundred and fifty rectangular ovens will be fired the first of the month to fill an order for 10,000 tons per month. The coke manufactured by the Allegheny Coke Co. is similar to Connellsville coke and the prices are about the same.

H. B. Dunham, who has been connected with the traffic department of the Hocking Valley Ry. Co. for 23 years retires from active work July 1 to be succeeded by H. Q. Wasson, who has been his assistant. Mr. Dunham does not resign but is retained in an advisory capacity. The position of traffic manager is abolished and Mr. Wasson will report directly to M. J. Caples, vice-president. Mr. Dunham is one of the best known traffic men in the country. Ill health is the reason for his retirement.

OBITUARY

John W. Moyer, a retired contract miner, died in Shenandoah, Penn., on June 25. He was 74 years old. During the early 60's Mr. Moyer took a prominent part in the development of some of the largest operations in the Schuylkill District.

Mine Foreman J. B. Kirkpatrick, of Johnstown, Penn., was instantly killed recently when he went to the rescue of a miner who had grasped a live electric wire. Kirkpatrick received the full force of the current through the body of Lotsi Solders, the miner, who was only slightly burned.

John H. Ross, superintendent of the Superior Coal Co. at Gillespie, Ill., died at his residence on June 23, at the age of 36 years. Funeral services took place from the residence under the auspices of the Masonic Lodge and at the Lutheran Church under the direction of Rev. L. Krekler. Interment was made at Gillespie Cemetery.

PUBLICATIONS RECEIVED

Department of the Interior, Bureau of Mines, Technical paper 88. "The Radium-Uranium Ratio in Carnotites," by S. C. Lind and C. S. Whittemore. Twenty-nine pages, 6x9 in., illustrated.

Dept. of the Interior, Bureau of Mines. "Mining and Milling of Lead and Zinc Ores in the Wisconsin District, Wisconsin," by Clarence A. Wright. Thirty-nine pages, 6x9 in., illustrated.

Department of the Interior, Bureau of Mines. "Monthly Statement of Coal Mine Fatalities in the United States, March, 1915," compiled by Albert H. Fay. Twelve pages, 6x9 in., unillustrated.

The Topographic and Geologic Survey of Pennsylvania, Report No. 8, E. "The Mineral Production of Pennsylvania in 1911." Richard R. Hice, State Geologist. Eighty-four pages, 6x9 in., unillustrated.

Illinois Coal Mining Investigation, State Geological Survey, Dept. of Mining Engineering, University of Illinois. Bulletin No. 12. "Coal mining practice in District IV," by S. O. Andros. Fifty-seven pages, 6x9 in., illustrated.

Department of the Interior, Bureau of Mines, Technical Paper 101. "Permissible Explosion Proof Electric Motors for Mines; Conditions and Requirements for Test and Approval," by H. C. Clark, illustrated, 17 pages, 6x9 in.

INDUSTRIAL NEWS

Philadelphia, Penn.—On Sunday, June 20, the steamer "City of Taunton" ran into and sunk the coal barge "Solace." The loaded barge was at anchor when struck by the steamer. Fortunately the "City of Taunton" was enabled to rescue all of the crew.

Philadelphia, Penn.—Private advices received here give the information that the British steamer "St. Joseph," which left here with a cargo of coal a few days ago, caught fire

at sea. The fire started in the cargo, but fortunately was confined to two of the holds and the vessel was not damaged.

Columbus, Ohio—All of the sales force of the Sunday Creek Coal Co., in charge of P. A. Coen, general sales manager and George F. Schwartz, assistant, inspected the San Toy and Congo mines of the company, following their attendance at the annual meeting of the Michigan-Ohio-Indian Coal Association.

Pittsburgh, Penn.—Shipments of coal and coke over the Pennsylvania R.R. east of Pittsburgh and Erie for the month of May amounted to 5,238,504 tons, an increase of 90,838 tons compared with the corresponding month of last year. From Jan. 1 to May 31, the shipments totaled 25,185,931 tons, or a decrease of 2,227,749 tons in comparison with a corresponding period of 1914.

Winchester, Ky.—Steel rails for the branch coal road up First Creek from the Lexington & Eastern Branch of the L & N. are being laid and construction is progressing. Two negroes owners of a tract near Hazard, have sold it for $60,000. Two years ago the same land could have been purchased for $5 an acre. A syndicate headed by C. G. Bowman made the purchase.

Philadelphia, Penn.—A prominent financial house has compiled figures bearing on the amount of money sent out of the country by foreign mine workers in the anthracite region. This statement shows that for the six months following the declaration of war the alien workers have been prevented from sending $10,000,000 as compared with the amount sent during the six months prior to the start of the European conflict.

Camden, N. J.—The New York Shipbuilding Co. is now building on account of West Virginia coal interests two 9000 ton steamers for the export coal trade to Mediterranean ports. The boats will be managed by the Crowley firm of Boston and will be of the same type as the colliers "Lingan" and "Hochelaga," built, in England, especially for the St. Lawrence coal trade. These boats have machinery amidships but are not self-trimmers.

Brilliant, Ohio—The property of the Dexter Coal Mining Co., located at Brilliant, Ohio, is to be sold at 1 p.m., July 30, upon the order of Judge Sater in the federal court. The court set $15,000 as the lowest price to be accepted. J. C. Ault is receiver for the Dexter Coal Mining Co. and will conduct the sale. The sale of the property was ordered at the instance of the Pittsburg-Buffalo Coal Co., which is named as plaintiff in the proceedings.

Ensley, Ala.—It has been announced by officials of the Tennessee Coal, Iron & R.R. Co. that No. 5 Blast Furnace at Ensley is being prepared to be put in operation within a short period. When this furnace goes into blast all six of the big iron makers at Ensley will be in operation for the first time in many months. It is felt throughout this region that the greatest industrial section in the South is once more falling into the active stride which has made it a centre of prosperity during past years.

Washington, D. C.—The United States Supreme Court has not yet entered the final order compelling the actual separation of the coal properties of the Delaware, Lackawanna & Western R.R. Co. from the railroad proper. The Lackawanna officials consequently have not yet learned when they must reorganize to meet the dictates of the commodity clause of the Hepburn Act. Until this order is entered the Lackawanna will not state its plans for the future as regards the coal-distributing business.

Washington, D. C.—A long and short haul order was recently entered by the Interstate Commerce Commission benefiting the New York Central R.R. in the matter of bituminous and cannel coal from Pennsylvania mines to Rhode Island points. The Commission granted the application of the New York Central R.R. and announced that the road may establish a rate of $2.45 per ton of 2240 lb. on bituminous and cannel coal in car loads from Pennsylvania mines to Olneyville, Providence and Auburn, R. I.

Chicago, Ill.—The petition of the Consolidated Indiana Coal Co. and the Monon Coal Co. to the Interstate Commerce Commission to equalize the rate from the Sullivan-Linton coal fields to Chicago with that in effect from the Brazil-Clinton group—a difference of 10c. per ton existing—was refused in a recent decision rendered by the Commission. This decision is a great disappointment to the Sullivan-Linton operators, who had hoped to be placed in an equal position with the Clinton shippers in selling their coal in the Chicago market.

Cincinnati, Ohio—The Ohio River Board of Engineers met in the office of United States Division Engineer Colonel Henry Jervey recently for the purpose of preparing an estimate of the amount of money which will be needed during the fiscal year, ending June 30, 1917, for Ohio River improvements. The estimate will be forwarded to the Chief of Engineers at Washington for presentation to the next Congress. The amount necesary for continuing the improvement of the river by lock and dams and for general river improvement, etc., will probably approximate $10,000,000.

St. Louis, Mo.—The first coal was put into the ovens of the new $2,000,000 coke plant of the Laclede Gas Light Co. in Carondelet recently. Only 33 of the 56 ovens were started since the bringing in of all the furnaces must be done gradually and carefully because of the expansion that is caused by the heat. About 200 men are now employed at the plant. The coal used is brought by rail from Kentucky near the Virginia line. It is expected that a barge line will be established later for the more economical handling of the coal. The H. W. Warren Coke Co., distributers, is booking orders for delivery.

Fleming—The week ending June 26 was the largest in point of coal shipments in the history of the Elk Horn Mining Corporation in the Fleming-Haymond field. This field has only been opened about two years and business looks brighter now than ever before. Five mines are running night and day to keep the orders filled. Men are scarce and good coal loaders are in great demand. The Lexington & Eastern R.R. is keeping the sidings clear of standing coal only by an extra effort and long hours on the part of the train crews. It is expected another train will be put on soon to take care of the steadily increasing output of these mines.

Bluefield, W. Va.—It has been announced by officials of the Carolina, Clinchfield & Ohio R.R. that traffic will begin over the new extension between Elkhorn City, Ky., and Dante, Va., about July 1. By the completion of this road the coal fields of eastern Kentucky, including the Elkhorn and Boone's Fork in Letcher County, will be given a southern connection and an important one. Much of the coal from the plants around Jenkins will go over the new Clinchfield road. On the 32 miles of this road there are 26 tunnels, one of them, the Sandy Ridge, being nearly two miles long. The work of concreting this big tunnel from end to end has just been completed.

Lexington, Ky.—Following a meeting of the officers of the Kentucky River Coal Corporation, it was announced that contracts have been made with various operators on First Creek, about three miles from Hazard, Ky., for a minimum output of 550,000 tons of coal annually. The coal will be sent to the market over the Lexington & Eastern branch of the Louisville & Nashville R.R. A 5½ mile spur is being built up First Creek for the purpose of getting the coal to the main line. The Harvey Coal Co., and the Blue Diamond Coal Co. have begun operations and a Cincinnati syndicate of coal men has taken a lease and will operate a mine under a corporation not yet completely organized.

Martinsburg, W. Va.—The coal tonnage moved over the Baltimore & Ohio R.R. system for 11 months of the present fiscal year shows a decrease as compared with the previous 11 months. From July 1 to May 31, the road hauled 26,475,988 tons of coal, as compared with 32,036,361 tons for the previous 11 months. During September of last year 2,878,836 tons of coal were moved, while during February of the present year 1,906,210 tons were handled. These were the best and poorest months of the period. Coke tonnage for the 11 months totaled 2,660,391 tons, as contrasted with 3,714,534 tons for the corresponding period of the previous fiscal year, thus amounting to a reduction of 1,054,143 tons for 1915.

St. Louis, Mo.—R. W. Ropiequet, of Belleville, Ill., attorney for the St. Louis Coal Operators' Traffic Bureau, has filed an argument and brief with the Interstate Commerce Commission against proposed advances in coal rates from various points in Illinois. The proposed advances are declared to be discriminatory against the Illinois mines when compared with competing fields serving the same territory, and as against the coal traffic as compared with other traffic upon which no advances are proposed. Issue is taken with the contention of the carriers that the present coal rates are comparatively unremunerative and that the coal does not bear its just proportion of the burden of transportation. The brief maintains that the coal traffic is the most important factor in the production of increasing return for the carriers, that it is a remunerative traffic and that it contributes more to the burden of transportation than the average traffic. It is declared that the advances proposed would result in a greater tonnage from the eastern fields via Duluth, no advance in the rate from these fields having been proposed, and the result would be that coal from these fields would supplant Illinois coal.

Coal Trade Reviews

General Review

Anthracite market dull and discouraging. Bituminous outlook continues cheerful though current market is under heavy pressure.

The heavy pressure on anthracite is forcing the companies to make concessions in the way of long-term credits that will carry the retailers over until the coal begins moving out to the consumers in the fall. In fact the market is full of conflicting rumors and cross currents. There are many retailers who are confident they will be able to obtain low prices well into September, but there are other conservative observers who predict a tremendous rush for coal to make up the deficiency caused by the deferred buying this summer. Chestnut coal is under particularly heavy pressure. There is an unusual amount of this grade going into storage, and it would not be surprising to see some heavy cuts offered shortly. Still more drastic curtailment programs have been instituted, and the leading companies will practically discontinue operations entirely during the first week of this month. The anthracite market has resolved itself into a waiting game for the time being.

It has developed that there has been considerable quiet buying of bituminous at the recent low level, and the best informed operators are proceeding cautiously over commitments on new business while conservative buyers are showing more of a disposition to close. It is still evident, however, that the current situation is soft in spots. Some pressure is evident on Hampton Roads coal although recent dumpings have been exceptionally heavy, and the accumulation reduced to a more normal basis than for some time.

The stir in iron in the Pittsburgh District has created a better feeling in trade circles although there has been a tendency to place an exaggerated value on this. The current market fails to reflect any actual improvement while the Lake trade continues disappointing with reports of large stocks at the upper ports. The anticipated movement of large crops in the fall is the most encouraging feature in the current situation.

Although the Ohio trade is being heavily over-solicited, there is still evidence of an improved tone. Interest for the moment is centered on the stocking business, and the poor collections are interfering with this to some extent. Industrial conditions fail to show any improvement, but the threshing demand is becoming a factor in the situation, and there is some activity on negotiations for school contracts.

The Middle Western situation is still characterized by a general uncertainty. More inquiries are reported in some directions, particularly for future delivery, and if these materialize into actual business, production will have to be materially increased. Stocks are generally low, and there must be some buying developed before very long. The operators have the price situation well in hand, and there is not a great deal of price cutting. Screenings continue the strongest department of the trade.

A Year Ago—Heavy curtailment in the anthracite region marked the inception of the usual mid summer lethargy. Individuals are working full and forcing the market. Eastern soft-coal buyers fail to respond to unusually low prices, and trade devoid of further absorbing power. Western situation is developing a better tone.

BUSINESS OPINIONS

Boston News Bureau—The attention of leading financial interests today is focused chiefly on the efforts of foreign governments to establish a credit here in order to make payments for purchases of war supplies. It is little wonder that the situation is perplexing. People are awaiting some definite trend to affairs before expanding their commitments. So long as the foreign outlook remains so clouded general conditions will be unsatisfactory. Manufacturers of war supplies are busy and could be much busier if they were confident of receiving quick payment for their products. Until, therefore, the ways and means for these payments are found there will be more or less hesitancy in operations.

Engineering News—Contracting work has not been so active. There are a great many small jobs in prospect, but the larger jobs are being held up awaiting more definite news relative to financiering. At least one contract has been noted where the condition precedent to the beginning of the work was that the United States should not be at war on Aug. 1. The expected shortage of labor has not materialized as yet. There is considerable apprehension at the steel mills, but outside of one or two instances there has been no difficulty in securing all of the needed labor. Among contractors no difficulty has as yet been experienced in securing sufficient men to do the work. This applies to all classes of laborers. Several strikes have occurred, which indicates that labor is better employed.

Dun's Review—Cross currents continue in business channels, but the tide of returning prosperity is gradually rising. Good news still predominates and further progress is manifest, notwithstanding the unseasonable weather at many points, and especially in the West. It is like old times to hear of orders in excess of capacity in some instances, and the mills are being pushed to meet the heavy demands.

Bradstreet's—Trade news is irregular, current distribution being repressed, but, on the other hand, orders for future delivey tend to enlarge. Unseasonable weather hampers retail trade, results in forced sales, restricts sorting-up orders going to jobbers and detracts from crop promise.

The Modern Miller—In Oklahoma heavy rains have damaged considerable wheat. In the southern part of the state three-fourths of the crop is in shock; in central districts one-half, and in northern Oklahoma cutting is light. In Kansas rains and flooding have caused some loss. Prospects are not materially below June 1. Nebraska has prospect of a large crop. Some districts report fly damage. Heavy hail storms have been a feature. In southern Illinois and Indiana heavy rains and wind have leveled wheat and delayed cutting. Much ripe wheat will be cradled. Northern Missouri, central Illinois, central Indiana and Ohio have prospects of fine wheat crop, but the movement will be late.

Am. Wool and Cotton Reporter—The wool market was comparatively active during the past week. The general trend of the market is upward and there is a very optimistic tone.

Iron and Steel—Some business in the heavy lines has developed in the last week. The American Bridge Co. was low bidder on 24,000 tons of fabricated material for the approach to the "Free Bridge" at St. Louis. A contract has been closed for a bridge at Kansas City involving 5400 tons. A new freight station in Chicago will call for 12,000 tons and the new shops that are being built in all parts of the country are taking a great deal of material. It is said that the shipments of tin plates in June by the leading interest were larger than any month since February 1913. It is estimated that the unfilled orders of the United States Steel Corporation will show an increase of 200,000 tons in June. The Republic Iron and Steel is operating to 90% of capacity and orders are being received involving more tonnage than is being shipped.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River prices uneven, but nothing significant has developed. Georges Creek unchanged. Pennsylvania shippers find their situation improved. Water freights slightly firmer. Anthracite curtailment forestalls any great accumulation of domestic sizes.

Bituminous—While there is no significant price movement the general feeling is that the Pocahontas and New River situation will bear close watching the next month or so. There are still soft spots in the market f.o.b. but at this end there is practically no coal awaiting purchasers. It develops that there has been considerable quiet buying the past fortnight when concessions were being offered and on the whole prices are somewhat firmer at this writing. It will, however,

take a material strengthening of the export market to bring about anything like a horizontal f.o.b. basis.

The uneven conditions at Hampton Roads piers with respect to coal standing are, of course, reflected in this market. Some of the agencies are pressing hard for business and others are holding aloof with a fair amount of current business on hand. The latter usually represent those shippers who have the more favorable connections with trade off-shore.

There are no new developments in Georges Creek. A large share of the output is still being reserved for export, chiefly on old sales, and only a minimum tonnage is coming forward to New England. So much business this year on this grade has been relinquished to the better known brands from Pennsylvania that it is probable that from now on Georges Creek will figure less and less in this territory.

Several of the Pennsylvania coals have made a good showing lately in the volume of coal placed and it is rumored some of the operators already have enough orders booked to leave them comfortable on a normal output the rest of the year. Prices are so far unchanged, but it is likely there will be a firmer tone in the course of a few weeks.

Water Freights are a little stronger than when last reported; 85c. is the current rate on large vessels, Hampton Roads to Boston, although a few steamers that are not at present available for traffic off-shore are accepting coastwise charters at 5@10c. less. Rates on Long Island Sound remain the same.

Anthracite—Shipments come forward very slowly. Curtailment is in effect in all parts of the region and little is now heard of any surplus in domestic sizes. The retail demand is beginning to start up but in view of the large stocks in New England there is not much prospect of any spurt to the wholesale demand until fall.

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.20@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.45@2.85	2.92@3.02	
New York*	2.40@2.95	2.75@3.15	3.22@3.32	
Baltimore*	.....	.....	2.85@2.95	
Hampton Roads*	.....	.....	.....	$2.65@2.80
Boston†	.....	.....	.....	3.60@3.78
Providence†	.....	.....	.....	3.45@3.73

* F.o.b. †On cars.

NEW YORK

Bituminous market experiencing one of its dullest periods though shipments are heavily curtailed and prices fairly steady. Anthracite consumers still holding off. Operations much reduced. Nut coal particularly long.

Bituminous—The export trade continues the big factor in the soft-coal market. While reports are heard from various sources of heavier demand for ordinary grades they always prove to be only flurries. The situation as a whole is in about the same condition as last week.

The market is experiencing one of its dullest periods. Fortunately operators are not flooding tidewater with coal, which enables wholesalers here to keep prices steady. There has been no material change in quotations for the past two or three months, although it has been possible for quick buyers to pick up stray cargoes at much lower figures.

There is little spot coal about the harbor and demurrage stock is not much in evidence. The mines are working about half time. Some operations with a good quality product are working nearly full time. Shippers have become reconciled to the situation and do not look for a better market until fall. Contract coals from the Southern ports are maintaining good prices.

Many new inquiries are reported by exporters with some contracts being closed. Much interest is being taken in the publication of the export statistics for June.

Current quotations continue about as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	3.00@3.10	3.00@3.10	3.00@3.10	1.45@1.55
Clearfield:				
Medium	2.65@2.80	2.55@2.65	.....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	.....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	.....	.....	1.35@1.50
Nanty Glo	2.75@2.80	.....	.....	1.20@1.25
Barnesboro	2.65@2.70	.....	.....	1.10@1.15
Somerset County:				
Quemahoning	.....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	.....	.....	.90@1.00
Greensburg	2.75@2.80	.....	.....	1.10@1.15
Westmoreland	2.95@3.20	.....	.....	1.15@1.40
West Virginia Fairmont		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—It is a waiting game in the anthracite market. No improvement is looked for until fall. Everybody who cares to has full bins but there are many who are still buying from hand to mouth. This condition is partly due to the present situation where it is possible to buy certain individual coals at April prices. Some retailers are of the opinion that they will be able to duplicate these prices in September. Money is short with many.

Restriction continues to be the rule at the mines. Individuals are now working on about the same schedule as the companies—about half time with some doing a trifle better. The usual rush of orders in the last week of the month to save the ten cents per ton discount did not materialize in June. Nut coal continues the longest of the prepared sizes; some cargoes were reported as being picked up at $4.65. Egg and stove sizes are quiet but moving better than nut coal.

The curtailing of operations is having its effect on the steam coal situation. These sizes are not much in evidence but are plentiful. The better grades are mostly in demand. The buckwheats are dull. Some grades of No. 1 have been quoted at $2 but the average has been higher for the better free-burning coals. Quotations on Schuylkill district rice coal vary from $1.65 to $1.70.

Current quotations are about as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.85		$4.90	
Egg	5.10	$4.80	5.15	$4.85
Stove	5.10	4.80	5.15	4.85
Chestnut	5.35	5.00	5.40	5.05
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.05@2.30	2.55@2.80	2.10@2.35
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite market is conflicting; some report slight betterment and others only continued inactivity. Chestnut price predicted to slump. Pea still low, with doubts as to future. Bituminous export business growing, but domestic market inactive.

Anthracite—Conditions are so variable and conflicting that it is difficult to make an accurate analysis of the market. In the city proper the dealers have practically concluded that they are done until frost comes, while from the suburban section come reports that business is holding up fairly well. Most operators complain of an unusual dullness, but two of the large companies report their tonnage for the month to date slightly increased over the same period last year.

There are rumors that chestnut coal is becoming so inactive that an unusual amount is going into storage and price cutting on this size would not be at all surprising. Chestnut has been more or less inactive since stove coal practically took its place in the market by a rearrangement of the circular prices two years ago.

There have been some peculiar angles to the pea situation. Low prices continue to rule, with little tonnage absorbed, and there are some who are becoming doubtful of the ability of this size to regain the circular price of $2.50 even in the fall; big sales are reported at $2, protected beyond the first of the year. On the other hand another company asserts they have at no time sold pea at less than $2.10 and that they have such confidence in a good fall trade that rather than sell at below that figure they are now arranging to store this size at the mine.

Another concern is reported to be making large deliveries of steam coal to their consignees with the understanding that payment is only to be made when the coal goes to the consumers in the fall. This arrangement practically resolves itself into giving the operator storage room without the usual cost of storing and picking up.

Most of the collieries have continued on the three-day working schedule and it is likely that the working time for July will be even less. Starting with the close of work Wednesday, June 30, the mines will not open until Thursday, July 8, this arrangement being made to cover the usual idleness due to the celebration of the Fourth of July.

From the midst of all the conflicting conditions the one dominant note of optimism persists and that is—we are going toward an exceptionally good business in the fall.

The new circular prices for July are as follows:

	City	Tide		City	Tide
Broken	$3.30	$4.55	Pea	$2.50	$3.25
Egg	3.55	4.80	Buckwheat	1.25	2.25
Stove	3.80	4.80	Rice	0.85	1.75
Chestnut	3.95	5.05	Barley	0.50	1.50

Bituminous—Despite the usual and expected summer dullness there appears to be a slightly improved tone to the market, especially on Tide shipments. One of the very largest

operators expressed satisfaction at the increased shipments from their mines, practically the entire production going to Tidewater. While the domestic trade is not near so active, yet improvement is in sight and felt to a slight extent. This should increase, as many of the largest industrial plants in this territory are going to full capacity and many of them are starting the erection of buildings that will double their plants in six months at the latest. Many of these plants have immense contracts for war munitions extending over periods from two to three years.

Prices have not appreciably changed and rule about as follows:

Georges Creek Big Vein..	$1.60@1.75	Fairmont gas, mine-run..	$1.15@1.25
South Fork Miller Vein..	1.50@1.60	Fairmont gas, slack.....	0.65@0.75
Clearfield (ordinary).....	1.00@1.20	Fairmont lump, ordinary.	0.85@0.95
Somerset (ordinary).....	1.00@1.15	Fairmont mine-run.....	0.75@0.80
West Va. Freeport.....	0.85@0.95	Fairmont slack.....	0.45@0.75

Ocean charters from Philadelphia have been announced as follows:

Vessel	Nationality	Destination	Tons	Rate
Thistleard	British	Spain	2533	
Oreland	British	Rio de Janeiro		
Millie R Bohannon		Charleston, S. C.	900	$1.10
Herbert May		Savannah	600	
Eva B. Douglas		Wilmington, N. C.		1.00
Charles N. Simmons		Porto Cabello		4.00

Note—Steamers are indicated by **bold face** type.

HAMPTON ROADS

Shipments foreign continue heavy, especially to Italian ports. Prices stationary with fair demand from foreign markets. Heavy railroad dumpings.

The dumpings over the various piers at Hampton Roads have shown up heavy, especially as regards cargoes for Italian ports. Coastwise shipments have been fair and the U. S. Government has also taken some coal. In addition to the New River and Pocahontas coal exported there has been some little high volatile and anthracite shipped. The anthracite, however, only amounted to 85 tons. Coastwise shipments have consisted of New River and Pocahontas mine-run, nut and slack and high volatile coals. Shipments foreign continue to move by sail as well as steam tonnage. The cargoes shipped in sailing vessels during the past week have all been for South American ports with one exception.

Prices at Hampton Roads remain practically the same as for some weeks but with the accumulation somewhat nearer normal. There is a fair amount of vessel tonnage in port with ample coal on hand to take care of same. The dumpings for the Norfolk & Western Ry. for June will be considerably in excess of their May shipments while those of the other two roads will be near their May figures.

The following vessels have cleared from Hampton Roads during the week June 18 to 25:

Norfolk

Vessel	Destination	Tons
Berwindvale	Havana	8100
Calabro	Naples	2362
Bellgrano	Peru	550
Dionyssios Stathato	Bilbao	5646
Orla	Rio	
Atland	Stockholm	6833
Agnelo Parodi	Santa Liberata	5355
Carlo	Cagliari	7100
Iddsleigh	Leghorn	5800
Ecaterini	Piraeus	5561
Labor	Spezia	5992
Dinsdalehell	Porto Ferrajo	6314
Augustus Welt	Rio	1592
Tsiropinas	Palermo	4505
Agnello Ciampi	Savona	4650
Sebastiano	Genoa	4288
Kineo	San Juan	2994
Margam Abbey	Rio	6900

Norfolk

Vessel	Destination	Tons
William Clifford	Canary Islands	2253
Ferm	Pernambuco	3080
Prosper 3rd	La Plata	5979
Jacatra	Port Said	8006
Tjisondari	Savona	8091
Ecclesia	Spezia	5700
Capac	Iquique	950
Patras	Genoa	4200

Newport News

Timandra	Rio	2000
Skogstad	Bridgetown	5545
Vulcano	Italy	7300
Giovani G.	Italy	5081
Gowenburn	Rio	5100

Note—Steamers are indicated by **bold face** type, others being barks and schooners.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending May 29	June 5	June 12	June 19	June 26
Norfolk & Western....	148,462	136,011	197,533	207,824	213,279
Chesapeake & Ohio....	68,678	44,702	39,447	71,511	79,870
Virginian.....	61,688	38,372	34,975	51,644	87,840
	291,828	239,085	321,955	330,979	380,989

BALTIMORE

Reports from mining districts indicate an increased production. Prices continue flat. Export trade holds up well.

An increasing demand from the Lake region and the big export movement are apparently having some effect. Several mining properties of the Maryland Coal Co. and the Davis Coal & Coke Co., for instance, are reported as now doing full time, or reopened for business, during the past ten days. Some companies in West Virginia are seeking men.

While this evidence of better business brings a feeling of encouragement, the coal trade realizes now that a general revival will be slow. Coal is still offered very cheaply at the mines. Demand on contract is slow, and those mining properties showing the present increase are for the most part working on some special orders.

Export business is holding up strong. During the week ending June 26 a total of 77,912 tons was sent out on export cargo account, while 13,248 tons was taken for bunkering. Chartering continues heavy, and there is every prospect for strong trade for weeks to come, at least.

The following steamers were chartered the past week, the Atlantic range quotations being noted, as several will load here:

Vessel	Nationality	Destination	Rate
Apolo	Spanish	River Plate	
Sowell	British	West Coast Italy	$10.56
Tsirapuria	Greek	West Coast Italy	
Mongibello	Italian	West Coast Italy	10.08
Sicania	Italian	West Coast Italy	10.08
Westgate	British	Campana	8.52
Francisco Ciampa	Italian	West Coast Italy	10.08
Allanton	British	Maddalena, Sicily	
Prosper III	Norwegian	River Plate	7.68
Chorley	British	Bahia Blanca	8.88
North Britain	British	River Plate	9.60
Two Ropner Steamers		West Coast Italy	9.60

OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Herbert May		Philadelphia	Savannah	318	
Eva B. Douglas		Philadelphia	Wilmington, N. C.	910	$1.00
Millie R. Bohannan		Philadelphia	Charleston	579	1.10
Henry S. Little		Philadelphia	Summerside, P.E.I.	984	2.25
Balgray	British	Baltimore[1]	Piraeus	2318	10.56
Patras	Italian	Baltimore[1]	Italy[2]	1729	9.60
Cleanthis	Greek	Baltimore[1]	Italy[2]	1938	9.93
Devian	British	Baltimore	Chili	2285	
Florida	Danish	Baltimore	Copenhagen[3]	2827	
Alston	British	Baltimore	River Plate	2363	
Oreland	British	Philadelphia	Rio Janeiro	2709	
Styliani Bebis	Greek	Baltimore	Italy[2]	2216	10.08
Angelo	Italian	Baltimore	Italy[2]	2333	
Kanaris	Greek	Baltimore	Italy[2]	2432	9.84
	British	Atlantic Range	Barcelona[4]	6500	8.88
Charles N. Simmons		Philadelphia	Porto Cabello	716	4.00
Lewis H. Goward		Baltimore	Porto Rico	1054	
Ferndene	British	Atlantic Range	Italy[2]	2444	9.84
Chulmleigh	British	Atlantic Range	Barcelona	2567	8.88
Angelesea	British	Virginia	Buenos Ayres	2795	3.12
					9.00
(Ropner Boat)	British	Atlantic Range	Italy[2]		9.60
Sidmouth	British	Atlantic Range	Italy[2]	2506	
Caprera	Italian	Atlantic Range	Italy[2]	3212	
Thistleard	British	Baltimore	Spanish port	2553	

Note—Steamers are indicated by **bold face type**, all others being schooners.
[1] Or Virginia. [2] West Coast. [3] Or Gothenburg. [4] Valencia or Tarrangona.

OCEAN FREIGHTS

Charters to Europe somewhat easier. Steamers to South America less plentiful.

A number of steamers were chartered last week for coal to Spanish and Italian ports, and numerous other boats offered for this business, at lower rates than those recently quoted. To the Plate steamers offer sparingly, and a steamer of about 7000 tons coal capacity was chartered, Virginia to Buenos Aires, at $8.64, option Port Militar at $9, but we consider these rates a little above the market, as we chartered steamers for similar business at lower rates.

Freight rates to other destinations are unchanged.

To	Rate	To	Rate
Havana.....	$2.00@2.25	Bermuda.....	**$3.00**
Cardenas or Sagua.....	**2.75**	Vera Cruz.....	3.50@3.75
Cienfuegos.....	2.75@3.00	Tampico.....	3.50@3.75
Port au Spain, Trinidad.	3.50@3.75	Rio.....	**8.64**
St. Lucia.....	**3.50**	Santos*.....	**8.88**
St. Thomas.....	3.00@3.25	Montevideo.....	**8.40**
Barbados.....	3.50@3.75	Buenos Aires or La Plata	**8.52**
Kingston.....	2.75@3.00	Rosario.....	**9.12**
Curacao.....	**3.50**	West Coast of Italy.....	**9.36**
Santiago.....	2.50@3.00	Barcelona**.....	**8.64**
Guantanamo.....	2.50@3.00	Valparaiso or Callao....	6.75@ 7.00
Demerara.....	**4.25**	Marseilles.....	**8.88**

Note—Rates noted in **bold face type** are only approximate.
* Consignees paying dockage dues. **Spanish dues for account.
W. W. Battie & Co.'s Coal Trade Freight Report.

COKE

CONNELLSVILLE

Sentiment less favorable, market failing to respond to what was considered good news. Prices no higher than in January. Shipments constantly increasing.

In some coke circles the feeling is distinctly less hopeful than a fortnight ago. It is reflected that if general indications really count for anything coke prices should have im-

proved long ere this. While Connellsville coke production and shipments have increased by two-thirds since last December, the increase has been chiefly in the coke of the producer-consumer class. The demand for merchant coke, which comes chiefly from the merchant blast furnaces, has increased but little, and a canvass of the merchant pig-iron trade suggests that perhaps the demand upon the merchant furnaces is not going to increase much after all, and if so there will not be much additional market for merchant coke. One merchant furnace, which has a coke contract at one price to July 1 and at 20c. more for the second-half, is considering blowing out July 1, finding it difficult to sell iron at any price. The coke market on the whole is no higher than it was in December or January and close analysis might show it actually a shade lower. We quote: Prompt furnace, $1.50; second half furnace, $1.75; prompt foundry, $2@2.50; contract foundry, $2.20@2.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended June 19 at 348,510 tons, an increase of 13,996 tons, and shipments at 351,774 tons, an increase of 19,181 tons. The increased production was due entirely to the furnace ovens, the merchant ovens losing a trifle. For five consecutive weeks shipments have increased. The low point in production and shipments fell last December, with about 200,000 tons a week.

Buffalo—The reported better feeling in iron continues and it affects the coke trade favorably in a way that it does not affect coal. Coke dealers are much encouraged, for they think it means better business in coal before long. There appears to be a larger supply of foundry than of furnace coke, with the price of the latter consequently stronger. Quotations are firmer on the basis of $4.25 for 72-hr. foundry, $3.80 for 48-hr. furnace and $3.30 for stock coke.

Chicago—Little change is to be reported in the price of coke. The demand for domestic coke is improving slowly, and prices are being well held. Furnace and foundry sizes are easy, and quotations somewhat variable. Prices are as follows: Byproduct, $4.65@4.85; Connellsville, $4.75@5; Wise County, $4.75; gas coke, $3.75@5, furnace, $4.65@4.75.

LAKE MARKETS

PITTSBURGH

Sentiment continues somewhat better but actual trade scarcely improved. Operations 55 to 60%. Slack a shade easier in price.

There is a continuance of the better sentiment in coal trade circles reported a week ago, but the market itself does not reflect any material improvement. The coal industry has perhaps expected too much from the observed improvement in the steel industry; the improvement, while very marked, is apparently due largely to the increased demand for steel for export, both direct export and the manufacture of war munitions for export, and that part of the steel demand does not of course involve any increased coal consumption. If the present demand for steel were all domestic it could not have occurred without a corresponding improvement in industrial conditions generally, requiring the consumption of more coal. The steel industry itself is now a good consumer of coal, but its customers are not correspondingly good consumers.

The Lake trade continues disappointing. The stocks at upper Lake docks are not worked off and shipments are kept at a low rate until the docks can be cleared. With such very good crop prospects, the coal movement later in the season should be much better, but for the first half to be bad and the second half moderately good seems to be about all that can be expected from the present Lake coal season.

Demand for export coal only occasionally reaches the Pittsburgh district, but the shipments of export coal from the Connellsville region are fair, and promise to increase. The Pittsburgh coal district is operating at 55 to 60% of capacity. Slack is a trifle easier, otherwise prices for free coal are unchanged, as follows: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. The contract market for mine-run, to Apr. 1, remains nominally $1.15.

BUFFALO

Some bituminous shippers are finding the demand slightly better. There is less coal waiting to be sold, but the same anxiety to sell. Anthracite not moving any faster.

Bituminous—The feeling is a little better each week. There is no doubt of a stir of some size in iron, but it is too small and recent yet to mean much to the coal trade. Some shippers will not admit that there is any improvement and are sure that there is not going to be any till after the warm weather is over. The amount of Youghiogheny coal on track is less which is a good sign; one shipper reports that he was lately unable to find any in the spot market and had to wait for it. This gives a better market to the cheaper coal produced nearer here and indicates that the other is going to another market. The lake trade is taking more bituminous coal than it was. The export demand is also better by ocean routes, though it does not appear that Canada is taking more.

Slack is selling at low figures but this also means a better Lake trade, as that turns out a large amount of slack. The lake cities prefer a larger proportion of sizes than is produced, so that the home market has to absorb some surplus slack, which often makes it dull through the Lake season. The bituminous prices are quoted as formerly for base, with perhaps a little less cutting than the average, best Pittsburgh lump selling at $2.70, three-quarter at $2.55, mine-run at $2.45, and slack at $2.25. About all the other coal coming here is Allegheny Valley, which takes a price of 25c. less.

Anthracite—The demand is still very light. A few independent shippers report a fair trade, but this is probably due to their not having a great amount to sell. This trade is larger than it used to be and it no doubt cuts into the old line companies somewhat. Local retailers are only doing a small business and will have to fall back on the city work or something of the sort to keep busy. It has been some time since the anthracite mines in general were running on such short time. But for the Lake trade, which is as large as it often becomes at this time of the year, the mines would be very inactive. Shipping agents in the Lake trade say that they have plenty of room on the Upper-Lake docks in spite of reports that sales there are not any more liberal than they are here.

The movement by lake for the week was 170,000 tons, nearly all going to Chicago, Milwaukee and the head of Lake Superior. The small ports appear to be well supplied and the shipments to leading ports are not generally represented by sales.

TOLEDO

Lake movement better. West Virginia coals particularly strong here.

Business generally is better especially in the Lake trade which has picked up wonderfully. The C. & O., docks have recently been doing a record business and the Hocking docks are also unloading quite a lot of coal. The big machines are working a good share of the time now and a boat can be loaded in a comparatively short time, 10,000-ton cargoes being loaded in about four hours. A great deal of West Virginia coal is moving.

Smokeless coal is not in very good demand but there is not very much on the market except mine-run which is extremely plentiful and cannot be moved at any price. Pittsburgh No. 8 is not moving freely. It is still early for threshing coal.

COLUMBUS

A slight improvement is noted in domestic trade. The stocking season is now at hand and there is a slightly better tone. Steam business continues quiet.

The attention of coal men is centered on the stocking season which is now at hand. It is believed that the demand for stocking purposes will be as large as ever, although deliveries are likely to be delayed. There is an improved tone and future prospects are brighter.

Dealers' stocks are the subject of considerable discussion; reports show that some are larger than usual while others are very low. This spotty condition extends throughout Ohio, Indiana and Michigan. Collections are poor which has a bad effect on stocking. Retail trade is quiet although some demand is reported for threshing purposes. Threshing coal is always quite a factor in the rural sections of Ohio. School coal is also attracting considerable attention and many contracts of that nature are being looked after.

Lake trade continues quiet because of the congestion at the Upper Lake ports. It is doubtful if there will be any marked increase immediately after July 1. The movement from the dock is still slow. Considerable West Virginia coal is being shipped to the Northwest but Ohio fuel is not moving as in former years. Eastern Ohio field is gradually increasing its Lake shipments. In the meantime the Hocking Valley docks at Toledo are fairly busy. The tonnage handled for the week ending June 25 was 98,000 as compared with 82,000 tons the previous week. The total tonnage handled over the docks since the opening of navigation is 741,000.

The only strong point in the steam department is the demand for nut, pea and slack, and that is because of limited production. There is much talk of export coal which will undoubtedly strengthen the Columbus trade, although no coal will be exported from Ohio.

Mines have been working at about the following percentage of full capacity:

District	Week Ended June 5	June 12	June 19	June 26	District	Week Ended June 5	June 12	June 19	June 26
Hocking....	30	25	25	25	Cambridge.	35	35	30	30
Jackson....	20	20	15	20	Masillon...	35	40	35	30
Pomeroy ..	50	50	50	45	Eastern O..	25	30	45	50
Crooksville.	35	30	30	25					
					Average..	33	33	33	32

Prices in the Ohio fields are:

	Hocking	Pomeroy	Kanawha
Rescreened lump	$1.45	$1.50	.....
Inch and a quarter	1.35	1.35	$1.30
Three-quarter inch	1.25	1.30	1.25
Nut	1.15	1.25	1.15
Mine-run	1.05	1.10	1.05
Nut, pea and slack	.70	.75	.65
Coarse slack	.60	.70	.55

CLEVELAND

Spot prices from 5 to 15c. under shipment quotations. Lake shippers moved all the coal they could get to the Lakes prior to the end of the month.

All kinds of coals were sold at extremely low prices Monday. No. 8 mine-run sold as low as $1.60, while three-quarter was only 5c. higher. Bergholz, Fairmount, and all Ohio coals went at proportionately low prices. Coal consumption is very much larger than two months ago, but the Lake business leaves too large a surplus for the local market to consume.

Lake shipments the first three days of the week were comparatively heavy. All shippers were working to gain credits on demurrage and cleaned up everything they could find tonnage to hold. The supply of ships was rather light the first half of the week, but the last half there was more capacity than could possibly be used.

Following July 4 the Lake shipments are expected to be much lighter than they have been. The local market is also expected to be rather depleted the first few days, but it will soon have more than enough. The Lake trade will be smaller all through July and part of August. New grain will begin to move the middle of August, and the coal shipments from Upper Lake docks will increase proportionately.

Shipment quotations are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump	$3.45	.....	.....	.....	.....
Lump, 1¼ in.	.....	$2.15	$1.90	$1.85@1.90	$1.85@1.90
Egg	3.45	.....	.....	.....	.....
Mine run	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack	.....	1.45	1.45	1.45	1.45

CINCINNATI

The market is very quiet with buying at a minimum. Steam consumption extremely slow.

As yet there is practically no stocking. The trade is being heavily over-solicited, and dealers feel that they can get coal at any time, in any quantities and at almost any price. The Lake movement is very small and unsatisfactory as compared with normal years, or even with last year. It is evident that Canadian consumption, which takes considerable coal through the lakes, will be very small. Industrial conditions remain bad save in a very few lines, and such contracts as have been closed are at substantial concessions, amounting to 10c. or more.

LOUISVILLE

Stocking movement to begin soon. Possibility of a readjustment in freight rates that will extend certain markets.

The Kentucky market shows virtually no improvement, except perhaps a disposition among the retailers to prepare for the consumers' stocking which will begin soon. The operators are watching with much interest the proceedings in the matter of the complaint to the Interstate Commerce Commission over division of rates on coal. The alleged unfair methods of certain railroads in division of their joint rates shut the Kentucky operators out of the contracts let by the Seaboard Air Line and the Atlantic Coast Line.

Prices are quoted on the May and June basis, as follows: Block, $1.30 to $1.40; round, $1.20 to $1.25. Nut and slack unchanged.

MIDDLE WESTERN

GENERAL REVIEW

Good future demand prompt shippers to uphold prices. Domestic sizes still slow. Screenings softer. No stir in anthracite.

Demand for coal grows slowly, but the general situation is improving. The steam trade shows a slight tendency toward lower prices, and screenings have softened 5c. to 10c. per ton but they are expected to improve again soon. The steam coal prices fluctuate with the increase or decrease in production of domestic sizes, and as the latter advance prices become easier on steam sizes.

Operators apparently have the price situation well in hand and there is very little cutting. The low stocks in the retail yards must necessarily cause increased orders shortly. More activity is being shown in industrial circles, and the railroads are reporting increased traffic, all of which will doubtless stimulate the demand for coal. The approach of the harvesting season has also caused increased orders for threshing trade.

It is said that several railroad contracts embracing considerable tonnage will be executed within the next ten days. An increasing number of inquiries covering future deliveries are coming in and if these materialize into orders production will have to be increased. Country dealers still complain of slow collections, and a great many of them are not stocking up for this reason. Lake shipments are still at a low ebb, and conditions confirm the previous prediction that no Lake movement of any consequence may be expected until toward the latter part of July.

CHICAGO

Price advances cause some increased buying at the month end. Screenings continue high.. Indiana market less favorable. Anthracite under pressure.

The Franklin County field has definitely announced advanced prices to take effect July 1, with resultant stimulation of orders for immediate shipment. The increase at the Illinois mines seems to be more particularly in the Southern group. The price situation in the Franklin and Williamson County fields is in a satisfactory state. Steam lump is somewhat draggy, with prices weak. Screenings have lost an average of 10c. per ton.

A fair volume of steam coal business has been done by Saline and Harrisburg operators and there has been good shipments of domestic sizes for harvesting purposes. There are no surplus screenings and operators are receiving top-notch prices for spot shipments.

The demand for steam sizes from the Indiana mines continues at a low point. No change in current prices for either steam or domestic coals has occurred. Orders for the threshing trade have not been as heavy as expected.

More harvesting coal is moving from the Clinton field than elsewhere, but the steam trade is soft. There is some Knox County coal moving to Chicago schools, but otherwise the mines are averaging about 2½ to 3 days per week running time.

Smokeless coals are firm at circular prices, and increased orders are being booked for the prepared sizes for July shipment. Mine-run has bettered, and a fair number of shipments are going forward at $1.25.

An increased number of orders have been placed for Hocking lump for July delivery. Some tonnage is moving for the harvest trade, and there is no free coal on the market.

Both Kentucky and West Virginia splints have been subject to price cutting. Block coal has been offered at as low as $1.15 and other sizes in proportion. A recent contract for splint is reported to have been made at a price considerably below that of last year for mine-run. Eastern Kentucky prices are most variable, and the market is not in good shape.

A slight increase was noted in anthracite buying toward the end of the month. The price disturbance in the East is evidently reaching Westward, and some concessions have been made by the independents to secure orders.

Quotations in the Chicago market are on about the following basis:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.35@1.50	$1.25@1.35	$1.35@1.45	$1.25@1.35	$1.30@1.40
Steam lump	....	1.15@1.25	1.10@1.15	1.15@1.25	1.30
2½-in. lump	1.15	....	1.25@1.30	1.20@1.30	1.30
1¼-in. lump	....	1.25	1.15@1.20	1.15@1.20	....
Egg	1.25@1.35	1.25@1.35	1.15@1.25	1.10@1.25	1.15@1.25
Nut	1.10@1.25	1.05@1.15	1.00@1.10	1.00@1.10	1.00@1.05
No. 1 washed	1.35@1.50	....	1.50	....	....
No. 2 washed	1.25@1.35	....	1.40	....	....
No. 1 nut	1.35@1.50	....	....	....	....
No. 2 nut	1.20@1.35	....	....	....	....
Mine-run	1.15@1.25	1.05@1.10	.85@1.00	.90@1.00	.85@1.05
Screenings	.80@ .90	.75@ .85	.70@ .80	.65@ .80	.65@ .85

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.25@1.35	$1.35@1.50	$1.90@2.00	$1.35@1.50	$1.35@1.50
1¼-in. lump	1.10@1.25	1.15@1.50	....	1.10@1.25	1.25
Egg	1.15@1.25	1.10@1.25	1.90@2.00	1.25@1.40	....
Nut	....	.90@1.25	1.40	1.15@1.35	1.15@1.25
No. 1 nut	1.25@1.35	....	1.25	....	....
No. 2 nut	1.20@1.30	....	....	....	....
Mine-run	1.10	1.00@1.10	1.10@1.25	1.15@1.25	1.15@1.25
Screenings	.90@ .95	.70@ .85	....	1.00@1.05	....

INDIANAPOLIS

Trade on the full summer basis with prices and production at the minimum. Improved outlook in industrial circles.

Production is down to a minimum and prices at the summer level with the exception of screenings, which hold up to 80 to 90c., most buyers holding off, to see if they will not sag to last year's level. There is moderate buying of Eastern coals by the yards of this city, but not as much as usual is going into storage.

The industrial demand is slow, outside of those factories working on war orders. The steel business is improving, however, the Illinois Steel Co., at Gary, Ind., having this week put its last furnace in blast and the output being up to full capacity, for the first time since 1912. Wheat cutting is in progress and the thresher demand for lump coal will open next week. The usual channels for Indiana domestic lump are almost closed, with the appearance again of summer weather.

ST. LOUIS

Country trade expanding and market is taking on a slightly improved tone.

The market has taken on a slightly stiffer tone, but the improvement has not been sufficient to favorably affect prices. The country trade is reported better than the city, partly due to the threshing demand and partly to improved crop conditions. The country orders are for lump, egg and nut. Country mills are starting up or getting ready to start and that is helping a little also. The Big Muddy Co. announces that the Southern demand is picking up, due to dealers in that section taking advantage of the plentiful supply of cars at this season.

Dealers in this part of the country, where car scarcity is not so troublesome, do not begin laying in a supply until August. The demand for Standard screenings is a little better. Williamson and Franklin County No. 1 nut has gone up a little.

The market is now quotable on about the following basis:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.25@1.35	$1.25	$1.25	$0.90
2-in. lump	.....	0.90	1.25	0.77½
3-in. lump	.....	....	1.15	....
3x6 egg	1.25@1.35	....	....	0.77½@0.80
No. 1 nut	1.30@1.35	....	....	....
No. 2 nut	1.15	....	....	....
No. 1 washed	1.25@1.35	....	1.35	....
No. 2 washed	1.15@1.25	....	....	....
No. 3 washed	1.20	....	....	....
No. 4 washed	1.15	....	....	....
No. 5 washed	0.80	....	....	....
Screenings	0.80@0.85	....	0.77½	0.80

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P.R.R. Co.'s lines east of Pittsburgh and Erie for May of the current year and the five months of 1914 and 1915, in short tons:

	May		Five Months	
	1915	1914	1915	1914
Anthracite	972,995	933,623	4,442,661	4,580,414
Bituminous	3,393,328	3,465,546	14,905,854	16,597,074
Coke	872,181	930,173	3,609,667	4,008,443
Total	5,238,504	5,329,342	22,958,182	25,185,931

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for April and the preceding three months:

	February		March		April	
State	1914	1915	1914	1915	1914	1915
Missouri	259,270	225,996	263,593	271,374	179,723	196,032
Kansas	492,304	492,320	501,841	522,242	378,192	410,565
Arkansas	113,354	102,451	165,037	90,252	87,002	80,118
Oklahoma	257,162	302,026	296,484	243,505	239,443	181,873
Totals	1,122,090	1,122,793	1,226,955	1,127,373	884,360	868,588

NORFOLK & WESTERN

Destination of shipments over this road for May of this year, the five months of this year and last year were as follows, in short tons:

	May		Five Months	
Coal	1914	1915	1914	1915
Tidewater, foreign	144,560	385,449	761,745	1,138,766
Tidewater, coastwise	336,958	262,281	1,652,101	1,314,290
Domestic	1,857,154	1,786,884	7,786,519	7,594,820
Coke				
Tidewater, foreign	.....	5,605	15	8,564
Domestic	88,145	73,665	492,732	358,202
Total	2,426,817	2,513,884	10,693,112	10,414,642

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during May and the past four months in short tons:

	February	March	April	May
Pocahontas Field	835,826	1,003,437	1,163,948	1,259,992
Tug River District	243,910	282,886	285,243	322,881
Thacker District	195,557	227,817	245,887	278,775
Kenova District	67,667	66,605	112,076	90,642
Clinch Valley District	129,193	144,031	138,970	144,576
Other N. & W. Territory	1,785	2,478	3,271	2,323
Total N. & W. Fields	1,473,938	1,727,254	1,949,395	2,099,189
Williamson & Pond Creek	58,101	48,052	55,311	84,086
All other railroads	88,982	129,446	195,845	251,339
Grand total	1,621,021	1,904,752	2,200,551	2,434,614

CAR SITUATION

The total surplus of coal and gondola cars on May 1 amounted to 105,852 and the shortage 73.

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during May and the previous two months:

	March		April		May	
	1915	1914	1915	1914	1915	1914
Coal	2,094,607	3,173,972	2,159,914	2,131,812	2,564,481	2,357,119
Coke	257,099	356,164	289,369	343,962	297,897	301,163
Total	2,351,706	3,530,136	2,449,283	2,475,774	2,862,378	2,658,282

FREIGHT RATES

I. C. C. No. 7036—Durham Coal & Iron Co. vs. Central of Georgia Ry. Co.

1. Rate on coke in carloads from Durham and Chickamauga, Ga., to Pacific coast terminals found unjustly discriminatory and unduly prejudicial to the extent that it exceeds the rate contemporaneously in effect to the same points from the Birmingham, Ala., district.

2. Minimum carload weight unreasonable when the cars in which the shipments are made are incapable of being loaded to that weight. Tariffs should provide that in such cases the marked capacity of the car used will govern.

I. C. C. Nos. 6618, 6666—Application of the Pennsylvania Co. under the Provisions of Section 5 of the Act to Regulate Commerce, as amended by the Panama Canal Act, concerning its interest in and operation of the Pennsylvania-Ontario Transportation Company.

Upon application of the Pennsylvania Co. and the Canadian Pacific Ry. Co. under the provisions of section 5 of the act to regulate commerce, as amended by the Panama Canal act, to continue their interest in and joint operation of the Pennsylvania-Ontario Transportation Co.; **Held:**

1. That the existence of through all-rail routes with joint rates applicable thereto in which the petitioners participate renders it possible for petitioners to compete with the boat line in which they are interested, within the meaning of the act.

2. Upon the facts of record the continued joint interest in and operation of the Pennsylvania-Ontario Transportation Co. by the petitioners herein is in the public interest and will neither exclude, prevent, nor reduce competition on the route by water under consideration.

FOREIGN MARKETS

GREAT BRITAIN

Export trade demoralized by the restrictions. Fears expressed of losing trade to South America.

June 18—The coal industry continues to be very seriously disturbed by the newer of the various abnormal factors which are now affecting it. The export regulations are making business very difficult in the shipping centers because of the refusal of so many licenses for exports to neutral countries. Exporters state that it is quite useless to attempt to obtain licenses for South America in particular, while it is growing harder to secure the sanction of the export committee for shipments to coaling stations and elsewhere, licenses being only given in special circumstances. Efforts on the part of the chambers of commerce and influential exporters to secure a modification of the restrictions have had no result. Many colliery owners in South Wales and elsewhere find themselves faced with growing stocks, and it is feared that instead of decreasing home prices, the only effect of the severity of the regulations will be to close down collieries. It is also pointed out that American coals are pouring into Brazil, the Plate, Argentine and Uruguay, and that it will not be easy to get the business back again. The possibility that the Board of Trade may fix a maximum price is also retarding inland business.—"The Iron and Coal Trade Review."

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principals in the coal trade.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page, all in Vol. 7, on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
869	Board of Education	Washington	Penn.	25,000[1]	1086
895	County Commissioners	Monticello	Ind.		1086
914	Board of Education	Fort Dodge	Iowa		1126
921	County Commissioners	Rensselaer	Ind.	400	1127
927	County Commissioners	Shelbyville	Ind.		1127
931	Board of Education	Sharon	Penn.		1127

[1] Bushels.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 598—New Orleans, La.—It is said that the United Fruit Co. is in the market for approximately 100,000 tons of coal for use on steamers operating out of Mobile and New Orleans to Central and South American points. Previous contract of this company was run in Vol. 7, p. 794. Address Purchasing Agent, United Fruit Co., New Orleans, La.

✚**No. 843—Columbus, Ohio**—Bids have been received on this contract (Vol. 7, p. 1049), which provides for furnishing the local county buildings with coal as follows: Fletcher-Williams Coal Co., Hocking mine-run, $1.59 at infirmary switch and $1.89 to the court house, morgue and Memorial building; M. A. Suydam & Co., Pomeroy, W. Va., mine-run, $1.95; Peacock Coal Co., same, $1.60 a ton at infirmary switch; J. Rapp & Co., court house, morgue and Memorial building, $1.90 and at infirmary switch, $1.65; Taylor-Williams Coal Co., West Virginia, Island Creek mine-run at court house and memorial hall, $2.11, at county morgue, $2.21 and at county infirmary switch, $1.74; Homer Gill, Hocking mine-run $1.70 at infirmary switch and at court house, memorial hall and morgue, $2.15; Elk Coal Co., Cedar Point mine-run at infirmary switch $1.70 and Hocking mine-run at infirmary switch $1.55; Lorain Coal & Dock Co., Island Creek, W. Va., mine-run $1.70 at infirmary switch; Victoria Coal Co., Hocking mine-run at infirmary switch $1.57½, West Virginia mine-run at infirmary switch $1.65; New York Coal Co., Hocking mine-run at infirmary switch $1.70; Maynard Coal Co., Pomeroy mine-run at infirmary switch $1.70; Maple Hill Coal Co., West Virginia mine-run at infirmary switch $1.85; Hocking Valley Products Co., Hocking mine-run at court house, Memorial building and morgue $2.03 and at infirmary switch $1.69; Franklin Builders Supply & Coal Co., West Virginia mine-run $2.17 delivered and Ohio mine-run $2.04 delivered. Address Clk. John Scott, Bd. of County Comrs., Columbus, Ohio.

✚**No. 856—Kansas City, Mo.**—This contract (Vol. 7, p. 1085), which provides for furnishing the local Board of Education with approximately 7000 tons of semianthracite and bituminous coal, will be awarded about July 15. Address Pur. Agt. F. S. Casey, Bd. of Edu., Kansas City, Mo.

No. 934—Worcester, Mass.—This contract (Vol. 7, p. 1127), which provides for furnishing the various public buildings at this place with coal during the ensuing year was bid on as follows: Anthracite, F. E. Powers Co., $6.79; Peoples Coal Co., $6.75; C. K. Smith Co., $6.94; O. G. Hedlund Co., $7.02. Bituminous (with a B.t.u. value ranging from 14,000 to 14,300), F. E. Powers Co., $4.70; Claflin-Summer Co., $4.79 or more; Peoples Coal Co., $4.57 or more; O. G. Hedlund Co., $4.84 or more. Address Supt. of Public Buildings George C. Halcott, Room 35, City Hall, Worcester, Mass.

New Business

✚**No. 943—Wescoesville, Penn.**—The Directors of the Poor of Lehigh County will receive bids until 2 p.m., on July 5, for furnishing the County Home with 1200 tons of bituminous and 200 tons of anthracite chestnut coal during the ensuing year. Bids should specify clearly what kind of coal it is proposed to furnish, and prices quoted should be f.o.b. cars at 17th and Gordon St. siding, Allentown, Penn. Address County Controller Cyrus J. Dilcher, Allentown, Penn.

No. 944—Chicago, Ill.—The Brighton Foundry Co. purchases a few cars of Illinois or Indiana mine-run from time to time. It will be in the market for one or two cars about Aug. 1. Address Purchasing Agent, Brighton Foundry Co., Chicago, Ill.

No. 945—Chicago, Ill.—Butler Bros. will be in the market about Aug. 1 for 2500 tons Illinois or Indiana screenings; also 2500 tons Illinois or Indiana egg or nut. The contract is let to May 1, 1916. Address Purchasing Agent, Butler Bros., Chicago, Ill.

No. 946—Chicago, Ill.—The Artesian Stone & Lime Works will purchase three cars of Pocahontas mine-run about Aug. 1. Address Purchasing Agent, Artesian Stone & Lime Works, Chicago, Ill.

✚**No. 947—Towson, Md.**—The Maryland State Normal School received sealed bids until 11 a.m., June 26, for furnishing 800 gross tons of Georges Creek Big Vein coal. Bids were to include cost of delivery in the bins of the power house. Address Secy. M. Bates Stephens, State Bd. of Edu., Annapolis, Md.

No. 948—North Vernon, Ind.—The Coöperative Enterprise Glass Co., at this place, purchases about 500 tons of good steam coal per annum. The present contract expires Aug. 1 and deliveries are at the rate of one car per month. Mine-run coal is required. Address Pres. Thomas P. Finnerty, Coöperative Enterprise Glass Co., North Vernon, Ind.

No. 949—Chicago, Ill.—The Acme Malting Co., of this place, will be in the market about Aug. 1 for two cars per week of Indiana mine-run coal. Address Pur. Agt. W. P. Rice, 4501 Cortland St., Chicago, Ill.

✚**No. 950—Linden, N. J.**—The Board of Education in this district will receive bids until 8 p.m., July 14, for furnishing about 200 tons of anthracite, pea, and nut coal. All bidders are required to furnish a certified check for one-quarter of the amount of the bid. Deliveries are to be made as required. Address District Clk. Thomas H. Keys, Bd. of Edu. School No. 1, Wood Ave., Linden, N. J.

✚**No. 951—Knoxville, Tenn.**—A committee has been appointed by the Board of Education to receive bids for the coal supply during the season of 1915 and 1916. The contract last year amounted to about $3000, and it is estimated that it will be even more this year. Address Fred W. Keith, Knoxville, Tenn.

✚**No. 952—Fairport, N. Y.**—The Fairport Municipal Commission will be in the market about Aug. 1 for approximately 2000 tons of bituminous mine-run coal. It is understood that the business is not let on competitive bids. The customary price is $2.75 per ton. Address Supt., C. J. Sullivan, Fairport Municipal Commission, Fairport, N. Y.

No. 953—Lynn, Mass.—The Board of Education at this place usually contracts for its annual fuel requirements about Aug. 1. The business last year was done on the following basis: 2057 tons New River coal at $4.20; 833 tons egg coal and 57 tons of stove at $6.75; 292 tons broken, $6. The call for bids is advertised. Address City Purchasing Agent, City Hall, Lynn, Mass.

✚**No. 954—Port Gibson, Miss.**—The Light & Water Department at this place usually contracts about Aug. 1 for approximately 1600 tons of Kentucky lump coal, which usually costs $3 per ton delivered. Business is let on competive bids. Address H. D. Brownlee Light & Water Department, Port Gibson, Miss.

No. 955—Manistee, Mich.—The Manistee Flouring Mill Co. at this place, usually contracts for their coal supply about Aug. 1. The company has lately been equipping its mill with electricity, so that their coal requirements will be materially reduced. Address Pres. G. A. Hart, Manistee Flouring Mill Co., Manistee, Mich.

No. 956—Petersburg, Ill.—The Abbott Light & Power Co., at this place consumes approximately 3200 tons of screenings per annum. Their contract expires about Aug. 1, and the business is let on competitive bids. The contract for the past year was at about $1.25 per ton. Address B. Hubbard, The Abbott Light & Power Co., Petersburg, Ill.

✚No. 957—Xenia, Ohio—The County Commissioners at this place will receive bids until 10:30 a.m., July 3, for furnishing coal as follows: Court House 200 tons; Greene County Library 50 tons; Infirmary Home 300 tons; County Jail, Pocahontas mine-run 35 tons. The supplies for the Heating Plant, Library and Jail are to be delivered in the bins and that for the Infirmary Home on side track convenient of access. One half the deliveries are to be completed before Sept. 1, and the balance before Feb. 1, 1916. Address County Commissioners, Court House, Xenia, Ohio.

✚No. 958—Washington, Ind.—The Electric Works at this place usually contracts about Aug. 1 for their annual requirement of coal involving about 5000 tons. Mine-run coal is required and the usual price is about $1.37 per ton delivered in the bins. The business is done on a competitive basis. Address The Electric Works, Washington, Ind.

✚No. 959—Wenatchee, Wash.—The Local School Board received bids until noon, July 2 for furnishing 140 tons of coal. Bids are requested both f.o.b. cars at Wenatchee, and delivered in bin. Specifications may be obtained on application. Address Clk. Theresa Unger, Bd. of Edu., Wenatchee, Wash.

✚No. 960—Harriman, Tenn.—The Harriman Water & Light Department usually contracts about Aug. 1 for their annual requirements of coal involving approximately 2160 tons. Middle Creek, Tenn., coal is ordinarily used, and the price is about $1.35. It is understood the business is not let on competitive bids. Address R. Walzl, Harriman Water & Light Dept., Harriman, Tenn.

No. 961—New York, N. Y.—Bids will be opened at 2 p.m., July 6, by the College of the City of New York, for furnishing and delivering 4800 gross tons of No. 3 buckwheat and 1600 tons, of semibituminous mine-run at Amsterdam Ave. and 139th St. Particulars may be obtained on application. Address the Curator of the College, Room 114, Main Building, 139th St. and Convent Ave., New York City.

✚No. 962—New Orleans, La.—The New Orleans Butchers' Abbattoir, at this place, are testing samples of steam coal and will contract for their annual supply some time during the current month. Address New Orleans Butchers' Abbattoir, North Peters and Alabo St., New Orleans, La.

✚No. 963—Aberdeen, S. D.—The Board of County Commissioners at this place will receive bids until 2 p.m., July 6 for furnishing the coal requirements for the Brown County House, Poor Farm, and County Poor during the ensuing year. Bids are requested on Kentucky block, Pocahontas and lignite coal. Address County Audr. J. C. Daly, Bd. of County Comrs., Aberdeen, S. D.

✚No. 964—Breckenridge, Penn.—Sealed proposals will be received until July 6 for furnishing the local public schools with screened and mine-run Bull Creek coal. Address Secy. John W. Girt, Breckenridge Borough Public Schools, Breckenridge, Penn.

✚No. 965—Kent, Ohio—Sealed bids will be received by the local Board of Education until 8 p.m., July 6, for the delivery of approximately 220 tons of three-quarter screened bituminous coal to the various school buildings. Address Clk. W. B. Andrews, Bd. of Edu. Kent, Ohio.

✚No. 966—Pineville, La.—It is understood that the State Hospital for the Insane at this place will contract in the near future for their fuel requirements during the ensuing year. About 12,000 tons will be required. Address Supt., State Hospital for the Insane, Pineville, La.

No. 967—Aspinwall, Penn.—Sealed bids were received by the local City Government until 7:30 p.m., July 3, for furnishing the pumping station with coal as required during the ensuing year. Quotations are made f.o.b. Aspinwall Pumping Station, and bidders were required to give the name of the mine from which the coal used is to be shipped. About 100 tons a month of nut, nut and slack, and slack coal will be required. Address Borough Clk., S. R. Chase, 230 First St., Aspinwall, Penn.

✚No. 968—Van Wert, Ohio—Sealed bids will be received by the local Board of Education until noon, July 6, for furnishing the various school buildings with approximately 400 tons of coal. Quotations are to include cost of delivery into the buildings as required. Bids are requested on Hocking ¾-in. screened, West Virginia mine-run, three-quarter and 5 in. screened. Address Clk. J. M. Showalter, Bd. of Edu. Van Wert, Ohio.

✚No. 969—Hillboro, N. D.—The County Commissioners at this place will receive bids until 10 a.m., July 15, for furnishing approximately 200 tons of Georges Creek smokeless or lignite coal, deliveries to be made in carload lots at the Court House, during the period Oct. 1 of the current year to May 1, 1916. Address County Audr. Nels O. Lindaas, Bd. of County Comrs., Hillsboro, N. D.

No. 970—Gretna, La.—The American Cotton Oil Co. at this place are said to be in the market for their supply of steam coal. Address American Cotton Oil Co., Gretna, La.

✚No. 971—Liberty, Ind.—The Board of Education at this place will receive bids until July 9 for 150 tons of Winifrede coal. Address Secy. F. T. Dubois, School Trustees, Liberty, Ind.

✚No. 972—Chicago, Ill.—The United States Gypsum Co., is reported to be in the market for 300 tons of fuel coke per month during the ensuing year. Address Purchasing Agent, United States Gypsum Co. 205 W. Monroe St., Chicago, Ill.

✚No. 973—St. Cloud, Minn.—Sealed bids will be received by the Board of Education at this place for furnishing approximately 300 tons of bituminous coal deliveries to be made on or before Aug. 3, at different buildings. Deliveries are requested on Fairmont nut, Youghiogheny screened lump, run apile, Hocking screened lump, run apile and nut. Address Secy. Julius Adams, Bd. of Edu. St. Cloud, Minn.

✚No. 974—Muscatine, Iowa—The Board of Education at this place will receive bids until noon July 6, for furnishing and delivering approximately 800 tons of coal to the various school buildings during the ensuing year. All the coal is to be four- to six-in. lump which is to be unloaded with forks and the residue delivered to buildings heated with boilers. Address Chn. Charles Ruthenberg, Fuel & Light Com., Bd. of Edu., Muscatine, Ia.

✚No. 975—Lake Benton, Minn.—The City Government here will receive bids until 7 p.m., July 6, for furnishing a car of Youghiogheny coal to be delivered at the pump house. Address Village Recorder E. M. Kimball, Lake Benton, Minn.

No. 976—Salem, S. D.—Sealed bids will be received by McCook County until 2 p.m., July 6, for furnishing various kinds of bituminous coal. Quotations should be made f.o.b. Salem. Address County Audr. C. F. Erickson, Salem, S. D.

✚No. 977—Brazil, Ind.—The Board of Education at this place received bids until July 2 for furnishing approximately 1000 tons of screened coal for the local school buildings. Address Secy. H. D. Falls, Bd. of Edu. Brazil, Ind.

No. 978—Kansas City, Mo.—The American Sash & Door Co., at this place, which is now buying its coal in the open market, is reported to be considering a proposition to contract for its requirements. They consume about 80 tons of bituminous coal per week. Address Purchasing Agent, American Sash & Door Co., Kansas City, Mo.

✚No. 979—Mitchell, S. D.—The City Government will receive bids until 8 p.m., July 6, for furnishing about 550 tons during the ensuing year. Deliveries are to be made as required. Bids are requested on Pocahontas mine-run, Youghiogheny, screened lump and Matilda lump and should be made f.o.b. cars, Mitchell. Address City Audr. Thomas Eastcott, Mitchell, S. D.

No. 980—Kansas City, Kan.—The National Zinc Co. expects to be in the market soon for its annual coal requirements for the year beginning Sept. 1. They ordinarily use Cherokee slack and mill coal. The plant is at Argentine, a suburb of Kansas City. Address Purchasing Agent, National Zinc Co., Kansas City, Kan.

✚No. 981—Bloomsburg, Penn.—The Board of Education is receiving bids for their annual fuel requirements amounting to 300 tons of No. 6, 50 tons of buckwheat and 25 tons of No. 4. Address Chn. C. L. Pensyl. Supply Com., Bloomsburg, Penn.

No. 982—Sheffield, Mo.—The Kansas City Bolt & Nut Co. is requesting bids to furnish their annual fuel requirements amounting to about 10 cars. Address Treas. H. K. Warren, Kansas City Bolt & Nut Co., Sheffield, Mo.

✚No. 983—Washington, Kan.—The County Commissioners will receive bids until noon, July 8, for furnishing 110 tons of screened Cherokee coal to be delivered in bins at the Court House and Jail. Address County Clk. F. C. McKelvy, Washington, Kan.

No. 984—Kansas City, Mo.—The Smith & Sons Mfg. Co., of this place will contract some time during the current month for 12 cars of slack coal to be delivered during the ensuing year. Address S. F. Smith, Lydia & Guinotte Aves., Kansas City, Mo.

✚No. 985—Washington, D. C.—It is unofficially understood that the Navy Department is negotiating orders aggregating

45,000 tons of coal to be delivered for bunkering purposes through Philadelphia. Address Paymaster General of the Navy, Samuel McGowan, Washington, D. C.

✚**No. 986—New Orleans, La.**—The Sewerage & Water Board of New Orleans will contract in August or September for their annual supply of steam coal amounting to between 10,000 and 18,000 tons. Address A. V. Wertz, Sewerage & Water Board, New Orleans, La.

No. 987—Kansas City, Mo.—The Witte Iron Works Co. at this place, which uses about 15 cars of Cherokee mill coal per year, are said to be considering a contract instead of buying in the open market as they now do. The plant is at Centropolis, Mo. Address Purchasing Agent, Witte Iron Works Co., Kansas City, Mo.

✚**No. 988—Atlantic City, N. J.**—The Government engineer will receive bids until July 12 for furnishing about 3000 tons of bituminous coal for delivery at this place. Complete information may be had on application. Address U. S. Engineer Office, Wilmington, Del.

✚**No. 989—Frankfort, Ky.**—The State Board of Control for Charitable Institutions will receive bids until noon, July 9, for furnishing coal during the fiscal year beginning July 15. These grades will be required: Eastern State Hospital at Lexington, mine-run; Central State Hospital at Lakeland, nut and slack; Western State Hospital at Hopkinsville, nut and slack and pea and slack; Kentucky Institute for Feeble-Minded Children at Frankfort, nut and slack. The contract will be let on a heat unit basis, and all bids must be submitted on blank forms, which may be obtained on application. Address Kentucky State Board of Control for Charitable Institutions, Capitol, Frankfort, Ky.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 205—Norristown, Penn.—This contract (Vol. 7, pp. 400, 626), which provides for furnishing the local School Board, has been awarded to **Bodey & Solomon** as follows: 150 tons stove, $6.15; 25 tons egg, $5.90. Metzger & Son obtained a contract for 115 tons of pea at $4.35. The award of 200 tons of bituminous coal was not made because it could be bought to a better advantage in the open market. Address Secy. Harry W. Akins, 717 DeKalb St., Norristown, Penn.

✚**No. 624—Providence, R. I.**—This contract (Vol. 7, pp. 795, 1126), which provides for furnishing the Board of Education with about 8500 tons of anthracite coal, has been awarded to the **Robert E. Smith Co.** at $5.98 for Highland egg and $6.23 for chestnut. Address Secy. Henry B. Rose, Public School Dept., 32 Summer St., Providence, R. I.

✚**No. 735—Davenport, Iowa**—This contract (Vol. 7, p. 917), which provides for furnishing the Board of Education with about 2900 tons of coal, has been awarded as follows: **Denger Bros.,** Springfield lump, $2.68; 2-in. Harrisburg screenings, $2.28. **Rock Island Fuel Co.,** 6-in. egg, $2.65. Address Secy. J. D. McCollister, Bd. of Edu., 1144 Main St., Davenport, Iowa.

No. 760—New Bedford, Mass.—This contract (Vol. 7, p. 955), which provides for furnishing the Board of Education with 2600 tons of egg and stove coal, has been awarded to **F. T. Akin & Co.,** at $6.84 per ton. Other bids on the contract were: Patrick Connor, $7.95; Dennison Bros. Co., $6.98; City Coal Co., $6.90. Address Clerk, Chas. P. Sawyer, Committee on Fuel, City Council, William St., New Bedford, Mass.

✚**No. 842—Columbus, Ga.**—This contract (Vol. 7, p. 1049), which provides for furnishing the local schools with coal during the ensuing year, has been awarded to the **Acton Coal Co.,** on Margaret lump coal at $1.80 per ton f.o.b., Columbus, Ga. Address Supt. R. B. Daniel, Public Schools, Columbus, Ga.

✚**No. 849—Dorchester Center, Mass.**—This contract (Vol. 7, p. 1049), which provides for furnishing the State Hospital with 275 tons of anthracite coal, has been awarded to **D. Doherty Co.,** on assorted sizes at $7.19 per ton. Address Henry Lafavour, Finance Com., Boston State Hospital Commission, Dorchester Center, Mass.

✚**No. 882—Tracy, Minn.**—This contract (Vol. 7, p. 1086), which provides for furnishing the local Board of Education with coal during the year beginning July 1 has been awarded to **Rialson & Son** on Youghiogheny lump at $5.55 per ton delivered at the School Buildings. Address Clk. C. C. Richard, Bd. of Edu. Tracy, Minn.

✚**No. 897—Lyndhurst, N. J.**—This contract (Vol. 7, p. 1087), which provides for furnishing the local Board of Education with about 90 tons of egg and 250 tons of pea coal, has been awarded to **Wm. H. Wurdemann** at $4.49 for pea and $6.25 for egg. O. Kiesewette & Co. bid $4.80 for pea and $6.30 for egg and Jesse P. Joralemon bid the same. Address Wm. J. Liston, Bd. of Edu., Lyndhurst, N. J.

✚**No. 866—Liberty, Ind.**—This contract (Vol. 7, p, 1087), which provides for furnishing the Municipal Government with about three cars of Island Creek mine-run coal, has been awarded to **C. A. Ward** at $2.80, delivered at the Water Works. W. H. H. Clark & Son bid $3.10. Address Town Clk. R. M. Duvall, Liberty, Ind.

No. 926—Detroit, Mich.—This contract (Vol. 7, p. 1127), which provides for furnishing the Police Department with its fuel supply, has been let to the **United Fuel & Supply Co.,** at $6.49 for stove and egg coal, and $6.74 for chestnut. Address Asst. Secy., Howard Whelan, Metropolitan Police Dept., Detroit, Mich.

✚**No. 929—New Orleans, La.**—This contract (Vol. 7 p. 1127), which provides for furnishing the Charity Hospital with about 6000 tons of coal during the ensuing year, has been awarded to **F. S. Walshe,** of the Tennessee Coal & Iron Co. Address Hon. Chas. A. Farwell, Charity Hospital, New Orleans, La.

Contract Notes

Davenport, Ia.—Denger Bros. of Davenport and the **Rock Island Fuel Co.** have been awarded contracts for supplying coal to the Davenport Public Schools.

Chicago, Ill.—Much favorable comment is heard regarding the manner in which the operators' association in Illinois has been maintaining prices in the face of the recent dullness.

Terre Haute, Ind.—The Acme Coal & Lime Co. of this city secured the contract for coal for the schools for next school year, at $1.98 a ton for Greene Valley, No. 4, 1½-in. shaker rescreened coal.

Tappen, N. D.—The Board of Education at this place will receive bids until July 12 for delivery of coal at the coal shed of Tappen School, District 28. Address, Clk. James McKee. Bd. of Edu., Tappen, N. D.

Lowell, Mass.—The mill of Wm. E. Walsh at this place consumes about 300 tons of New River coal per annum, which is delivered by wagons from the railroads. The mill has a storage capacity of 50 tons.

Greenville, Penn.—The School Board at this place will receive bids until July 5 for hauling coal from Canon & Miller and Zuschlag coal banks to the 14 school houses located in the district. Address, Secy. I. C. Brown, School Bd., Greenville, Penn.

Buffalo, N. Y.—The bids for supplying coal to the county institutions were opened by the Board of supervisors on June 25 (p. 957). They are quite complicated and are in several divisions, and it will require sometime to determine the lowest bidder.

Pottstown, Penn.—The contract for supplying the public schools at this place has been awarded as follows: 320 tons of pea at $4.60 and 50 tons of broken $5.75 to **J. H. S. Griess & Co.;** and 150 tons of bituminous coal at $3.25 to Hatfield & Hilles.

Spain—An American consular officer in Spain reports that a business man in his district desires to import coal. Prices and full information should be sent at once. He desires to receive quotations c.i.f. destination, otherwise f.o.b. New York. Correspondence may be in English. References are given.

Chicago—The American Can Co. has placed contract with the **Consolidated Indiana Coal Co.** for fifty per cent. of its requirements of screenings for next year at its four plants, located in Chicago, Maywood and Joliet. It is understood that the contract covers Hymera Fifth Vein screenings at 75c. per ton at the mines.

Milton, Ky.—Local coal yards in this river town are filled to capacity for the first time in months. The dealers, the Trimble Milling Co., and J. P. Strother are all reported to be stocked up with enough coal to last for perhaps a full year. The coal at this point is unloaded from the barges into wagons with a steam shovel and a steam winch is used in assisting the teams up the levee slope.

Knightstown, Ind.—The contract for furnishing the Indiana Soldiers' & Sailors' Orphans' Home at this place, regarding which an item was run on p. 1088 of Vol. 7, has been awarded to **Walter Bledsoe & Co.,** on No. 4 Linton mine-run coal at $1.80 per ton. The coal furnished by the Ohio & Kentucky Coal Co. who had this contract during the past year gave excellent results but it is computed that $900 per annum is saved by using the local product although this latter does make more ash and clinkers and is not so desirable to burn. Address Steward F. F. Boltz, The Indiana Soldiers' and Sailors' Orphans' Home, Knightstown, Ind.